Human Ecology and Family Sciences

Part I

11136

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Foreword

The National Curriculum Framework (NCF) 2005 recommends that children's life at school must be linked to their life outside the school. This principle marks a departure from the legacy of bookish learning which continues to shape our system and cause a gap between the school, home and community. The syllabi and textbooks developed on the basis of NCF signify an attempt to implement this basic idea. They also attempt to discourage rote learning and the maintenance of sharp boundaries between different subject areas. We hope these measures will take us significantly further in the direction of a child-centred system of education outlined in the National Policy on Education (1986).

The success of this effort depends on the steps that school principals and teachers will encourage children to reflect on their own learning and to pursue imaginative activities and questions. We must recognise that, given space, time and freedom, children generate new knowledge by engaging with the information passed on to them by adults. Treating the prescribed textbook as the sole basis of examination is one of the key reasons why other resources and sites of learning are ignored. Inculcating creativity and initiative is possible if we perceive and treat children as participants in learning, not as receivers of a fixed body of knowledge. These aims imply considerably change in school routines and mode of functioning. Flexibility in the daily time-table is as necessary as rigour in implementing the annual calendar so that the required numbers of teaching days are actually devoted to teaching.

This textbook marks NCERT's resolve to reconstruct knowledge in all areas from the perspective of the learner and the dynamic socio-economic realities of contemporary India. The National Focus Group on *Gender Issues in Education,* appointed under the auspices of NCF-2005, emphasises the urgency of incorporating women's perspective for epistemologically redefining conventionally defined subjects like home science. We hope that the present textbook will make this subject free of gender bias and capable of challenging young minds and teachers for creative study and practical work.

NCERT appreciates the hardwork done by the Textbook Development Committee and its Chief Advisors, Neerja Sharma, Lady Irwin College, University of Delhi and Shagufa Kapadia, M.S. University, Baroda, Vadodra. We are indebted to the institutions and organisations which have generously permitted us to draw upon their resources, material and personnel. We are especially grateful to the members of the National Monitoring Committee, appointed by the Department of Secondary and Higher Education, Ministry of Human Resource Development under the Chairpersonship of *Professor* Mrinal Miri and *Professor* G.P. Deshpande, for their valuable time and contribution. We are particularly grateful to the members of the sub-committee for Human Ecology and Family Sciences (HEFS), Mariamma Varghese, *former Vice-Chancellor*, SNDT Women's University, Mumbai, and S. Anandalakshmy, *former Director*, Lady Irwin College, University of Delhi for their contribution for reviewing the textbook.

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As an organisation committed to systemic reform and continuous improvement in the quality of its products, NCERT welcomes comments and suggestions which will enable us to undertake further revision and refinement.

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Research and Training

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Rationalisation of Content in the Textbooks

In view of the COVID-19 pandemic, it is imperative to reduce content load on students. The National Education Policy 2020, also emphasises reducing the content load and providing opportunities for experiential learning with creative mindset. In this background, the NCERT has undertaken the exercise to rationalise the textbooks across all classes. Learning Outcomes already developed by the NCERT across classes have been taken into consideration in this exercise.

Contents of the textbooks have been rationalised in view of the following:

- Overlapping with similar content included in other subject areas in the same class
- Similar content included in the lower or higher class in the same subject
- Difficulty level
- Content, which is easily accessible to students without much interventions from teachers and can be learned by children through self-learning or peer-learning
- Content, which is irrelevant in the present context

This present edition, is a reformatted version after carrying out the changes given above.

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PREFACE

The textbook on Human Ecology and Family Sciences (HEFS), a subject so far known as 'Home Science', has been reframed keeping in view the principles of the National Curriculum Framework – 2005 of the NCERT. Conventionally, the field of Home Science encompasses five areas, namely, Food and Nutrition, Human Development and Family Studies, Fabric and Apparel, Resource Management, and Communication and Extension. All these domains have their specific content and focus that contribute to the study of the individual and the family in Indian socio-cultural context. They also provide ample scope for professional avenues of higher education and career opportunities in this applied field. Many components of the field have grown to become specialised areas and even super-specialisations. They range from professions catering to various health and service institutions/ agencies, educational organisations, industry and business houses of textiles, garments, foods, toys, teaching-learning materials, labour saving devices, ergo-nomically appropriate equipment and work stations. In Class XI the 'self and family' and the 'home' are focal points for understanding the dynamics of individual lives and social interaction. In Class XII, the emphasis will be on 'work and careers' through the life-span.

The subjects in HEFS concern themselves with enhanced human resources as well as productivity, and with better quality of life for individuals and society in general. People cannot be productive if they are physically unwell due to unhygienic personal and environmental conditions, children cannot learn if they are mal-nourished, or scarred from abuse and neglect, people cannot work if disturbed by family turmoil or resource management problems, or when preoccupied with rejection in the family or domestic violence. Conversely, human beings whose development is fostered by positive environmental surroundings, nurturing relationships, good nutrition, access to basic amenities for health, safety and sanitary living conditions, can be well-adjusted and productive citizens.

The possibilities of teaching and research careers are present at all levels of education, be it at school or college or university. To the professionals in the specialisation of Food and Nutrition, the spectrum of opportunities is wide ranging from the service sector as dietitians, healthcare consultants/counsellors to the food industry, in catering and food service management/institutional management, in accordance with the thrust of their educational inputs and acquired interests, skills and competencies. For professionals in Human Development and Family Studies, job opportunities range from being at several cadres of functionaries in social development organisations for children, adolescents, women and families, in early childhood care and education programmes, to being professionals in counselling settings at various levels and age groups. Those trained in Fabric and Apparel find their future careers in textile design, textile or fashion or garment industry, and entrepreneurship.

To the Resource Management trainees, the career choices abound between interior decoration, hospitality administration, ergonomics, to consumer education

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and services as well as entrepreneurship, event management, investment and insurance enterprising. Those who specialise in Communication and Extension can work in media related fields, or be welfare and programme officers, administrators and supervisors in field-based activities of NGOs, private and public sector organisations.

The new textbook has attempted to break away from the conventional framework of the discipline in significant ways. In the new conceptualisation the boundaries between different areas of the discipline have been dissolved. This has been done to enable students to develop a holistic understanding of life in the home and outside. A special effort has been made to communicate respect for every student's life at home and in society by making the curriculum appropriate for both boys and girls, living in different contexts, including those who are homeless. It has also been ensured that all the chapters address the significant principles of equity, equality and inclusiveness. These include gender sensitivity, respect for diversity and plurality in relation to rural-urban and tribal location, caste, class, value for both transformative traditions and modern influences, concern for society and pride in national symbols.

The practicals have an innovative and contemporary character and reflect the utilisation of new technology and applications that would strengthen critical engagement with the lived realities of people. More specifically, there is a deliberate shift to field-based experiential learning. The practicals are designed to foster critical thinking. Further, conscious effort has been made to move away from stereotyped gender roles, thus making the experiences more inclusive and meaningful for both boys and girls. It is imperative that the practicals are conducted keeping in mind the available resources.

The textbook adopts a developmental framework using the life-span approach. However, it is structured a little differently in terms of the sequence of stages in human development. The first unit begins with adolescence, as this is the stage of development being experienced by the student. Beginning with one's own stage of development would instill interest and enable identification with the physical, emotional, social and cognitive changes that the student is undergoing. Once the adolescent learner develops some understanding of the self, the second unit spans to the diverse contexts in which one functions — these include the family, school, community and society. Relationships, needs and concerns stemming from each context are dealt with in this unit. Following this are two units dealing with the study of ecological and family issues arising in childhood and adulthood respectively. This approach would help the learner understand and analyse the significance of nutrition, health and well-being, growth and development, education and communication, apparel and management during these two phases of life, thereby completing the cycle of development. Thus the textbook addresses some significant concerns and challenges of each life stage, providing reasonable suggestions and resources necessary to enhance the quality of life of self, family, community and society.

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OBJECTIVES

The HEFS textbook has been framed to enable the learners to

1. develop an understanding of the self in relation to family and society.
2. understand one's role and responsibilities as a productive individual and as a member of one's family, community and society.
3. integrate learning across diverse domains and form linkages with other academic subjects.
4. develop sensitivity and critical analysis of issues and concerns of equity and diversity.
5. appreciate the discipline of HEFS for professional careers.

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1

Introduction

Human Ecology and Family Sciences

Evolution of the discipline and its relevance to quality of life

Let us begin by trying to understand the title of this subject — 'Human Ecology and Family Sciences' (HEFS). The dictionary explains the term 'ecology' in two ways. Firstly, it is referred to as a branch of Biology that deals with relations between living organisms and their environment. Secondly, it is stated to be a complex of relationships between an organism and its environment. Borrowing from biology, in our context, the 'living organism' is the human being, and hence the term 'Human' precedes 'Ecology'.

Through this subject you will be studying about human beings in relation to their environment. Additionally, there will be a study of dynamic relationships that children, adolescents and adults have with the various physical, economic, social and psychological elements in their ecology.

The expression 'Family Sciences' is an equally significant segment in the title. As you would agree, the family is central in most individuals' lives. It is within the family that children are nurtured, so that they develop and acquire independent identities as adults. While studying this subject, the students will be guided in understanding the individual in the context of the family, which in turn is a critical social unit of society. 'Human Ecology and Family Sciences' follows an integrated approach in the teaching-learning process. More importantly it deals with the interaction of human beings as members of their families and the society with the environment. This forms a synergistic relationship with their ecology, which amalgamates within it physical, psychological, socio-cultural and economic resources.

In the Class XI curriculum, you would notice that particular attention has been paid to the stage of adolescence, as this period is known to be a turning point in one's life. Thus, you will study how

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adolescents develop an understanding of themselves, and what role food and other resources, fabric and clothing, as well as communications play in their lives.

A subject close to HEFS, though not exactly like it, is Home Science. It has been taught under this title at both the higher secondary and university levels in different parts of the country. With changing times, many disciplines of study have taken new forms and assumed a more contemporary nomenclature; for example, Life Sciences is being used to refer to biological sciences. There was a need to modernise the content of Home Science at the school level, and give it a title that would release it from being associated mainly with the home and with the tasks traditionally done by girls and women. At the university level the University Grants Commission undertook this exercise many years ago.

Here, a brief history of the evolution of Human Ecology and Family Sciences from the field of Home Science in India would be in order. In the early 20th century there were many institutions in different parts of the country that had introduced courses in Foods and Nutrition, Clothing and Textiles, as well as Extension Education. These different disciplines were brought under the rubric of Home Science in 1932, when an institution by the name of Lady Irwin College was set up in Delhi to promote women's education. This was the time before India's independence from the British rule, when very few girls attended school, and hardly any institutions for women's higher education existed.

A few eminent women were in the vanguard of the movement to liberate India. Among them were Sarojini Naidu, Rajkumari Amrit Kaur and Kamaladevi Chattopadhyay, stalwarts of the All India Women's Conference, who conceived of and established the Lady Irwin College. The British Viceroy in India at that time was Lord Irwin, and his wife, Lady Dorothy Irwin too supported the setting up the college. Hence, the College was set up in her name. The goal was to serve the home and society with equal resolve, so as to remove social and educational inequalities that prevented women from reaching their potential.

Thus, Home Science was not intended to be a subject only about the 'home', but to be an interdisciplinary field that would empower its students to enhance their own quality of life and that of other individuals and families. However, over time, the label Home Science (in the mind-set of lay people and non-Home Science professionals) became associated primarily with learning culinary skills, laundry and child-care. While at the higher education level an upgrading of the curricula as well as resetting of the professional standards took place several years ago, at the high school level, its gender-typing and association with 'cooking and laundry' remained. In fact, those were some of the reasons why boys were either not admitted to this area by the schools, or they themselves shied away

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from studying it as it was seen as a subject only for girls. It was wrongly perceived as lacking in rigour.

The present curriculum that has guided the preparation of the textbook is contemporary in its content and approach. It is so designed and presented that you will identify with the issues discussed. The title 'Human Ecology and Family Sciences' was considered to be most appropriate to reflect the spirit of the course. As you read the chapters, you will realise that the subject is multi-disciplinary. It contains within it fields such as Human Development, Food and Nutrition, Fabric and Apparel, Communication and Extension, and Resource Management. Knowledge in these areas is essential to sustain and augment one's quality of life, whether one lives in a village or a town, and whether the person is female or male. The textbook, it is hoped, will answer some of the questions young people have about their lives, and not be perceived merely as a means to clear exams.

Key Terms

Ecology, Family, Adolescence, Home Science, Gender-typing, Contemporary, Multi-disciplinary, Quality of life.

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EXERCISE

A. Do you know about the subject Home Science? Yes No
If your answer is 'no', please ask your teacher.
List 5 terms/concepts that you associate with Home Science.
1. _____
2. _____
3. _____
4. _____
5. _____

B. At the end of the year after you have studied this book 'Human Ecology and Family Sciences' list 5 areas of study that you would associate with the subject.
1. _____
2. _____
3. _____
4. _____
5. _____

REVIEW QUESTIONS

1. Explain the terms ‘Human Ecology’ and ‘Family Sciences’.
2. Do you agree that adolescence is a ‘turning point’ in one’s life?
3. Name the eminent women who conceived of starting the first Home Science college in India.
   a._____
   b._____
   c._____
   d._____

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UNIT I

UNDERSTANDING ONESELF: ADOLESCENCE

Unit I focusses on the stage of adolescence — the stage of life to which you belong at present. This unit deals with understanding your own self in terms of your personal and social identity, your nutritional and health requirements, management of basic resources of time and space, fabrics around you, and your communication skills. The last chapter of the unit situates the adolescent in the context of the family and larger society, thereby linking it to the next unit that deals with the individual in relation to her/his family, school, community and society.

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UNDERSTANDING THE SELF

A. WHAT MAKES ME 'I'

2

LEARNING OBJECTIVES

After completing sections A, B and C the learner is able to —

- discuss the importance of knowing oneself and the significance of developing a positive sense of self.
- list the factors that influence the development of selfhood and identity.
- analyse why the period of adolescence is critical for the development of self and identity.
- describe the characteristics of self during infancy, childhood and adolescence.

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2A.1 INTRODUCTION

While we all have many things in common with our parents, siblings, other relatives and friends, each one of us is also a unique person, different from all others. This sense of being unique gives us our sense of self — the sense of 'I' which is different from 'you', 'them' and 'others'. How do we develop this sense of self? What we think about ourselves and how we describe ourselves — does it change over the years? What are the elements of the self? Why should we study about the self? Does our self influence the way we interact with people? In this unit we will study about these and other interesting aspects of the self.

Related to the concept of the self are two other concepts — identity and personality. While psychologists distinguish between these three concepts in terms of their definitions, the concepts are intricately related and we often interchange these terms in common usage.

2A.2 What is Self?

The Webster's Third New International Dictionary contains 500 entries that begin with 'self'. The sense of self refers to the sense of who we are and what makes us different from everyone else. During adolescence — the period you are going through presently — we start thinking more than ever about who am I? What makes 'me' different from 'others'? At this stage, more than at any other stage before this, we try to define our 'self'. Some of you may have given this question a lot of thought, while some others may not be aware that they have been thinking of these aspects.

Activity 1

Complete the following sentences starting with – I am.

1. I am.....
2. I am.....
3. I am.....
4. I am.....
5. I am.....
6. I am.....
7. I am.....
8. I am.....
9. I am.....
10. I am.....

Re-examine the statements you wrote to describe yourself, some of these described the physical aspects of yourself, you described your bodily self; in some you referred to your feelings and emotions; in some you described yourself in terms of your mental abilities; in some others you may have described yourself in relation to others, in terms of the roles you perform and the relationships you are involved in every day such as son/daughter, wife/sister, student, i.e., you defined yourself in terms of your social relationships in the family and community. Some of you may have described yourself in terms of your **potential** or **capabilities** and some others in terms of your beliefs. In some you described yourself as a doer, as a person performing actions, as an agent, while in others you described yourself as a thinker. Thus, you can see that the self has several dimensions. Very broadly speaking we can think of these various dimensions of the self as the personal and the social. The personal self

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has those aspects which relate only to you while the social self refers to those aspects where you are involved with others, and includes aspects like sharing, cooperation, support and unity.

We can say that the term self refers to the totality of a person's experiences, ideas, thoughts and feelings with regard to herself/himself. It is the characteristic way in which we define ourselves. **The idea that we hold of ourselves is the notion of the self.**

You must have heard and used the terms self-concept and self-esteem with reference to yourself and with others. What do you mean when you use them? Write your thoughts in the box below and discuss these after reading the definitions given after the box.

For your thoughts....

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Self-concept and **self-esteem** are elements of identity. Self-concept is a description of oneself. It answers the question of 'Who am I?' Our self-concept includes our qualities, feelings and thoughts and what we are capable of doing.

An important aspect of the self-concept is self-esteem. Self-esteem refers to our judgment of ourselves according to the standards we have set for ourselves which are largely influenced by society. It is one's evaluation of oneself.

2A.3 What is Identity?

Refer to Activity 2 on this page. What did you conclude — 'Yes', you are the same person or 'No', you are not the same person, or was your answer both 'Yes' and 'No'! Which is quite likely. Over the years your body has undergone many changes, you know many more people now as compared to earlier times, and you have developed a certain relationship with them. Your way of responding to and understanding events may have changed, you may have changed some of your beliefs and values, and your likes and dislikes may have also changed. So you are not really the same person as you were even a year ago! Yet, you have an unmistakable sense of having been the same person from as far back as you can remember. Most of us are able to maintain a sense of continuity and sameness throughout our lives despite the many changes and discontinuities that mark our life over the decades. In other words, we all have a sense of **identity**, a sense of who we are which we carry throughout our lives. Just as in the case of self, we can talk of personal identity and social identity. **Personal identity** refers to those attributes of a person that make her different from others. **Social identity** refers to those aspects of the person that link her to a group – professional, social or cultural. Thus, when you think of yourself as an Indian you have linked yourself with a group of people living in a country. When you describe yourself as a Gujarati or a Mizo, you are saying that you share some characteristics with the people living in that state, and that these characteristics seem to you to be different from people living in other states of India. Thus, being a Gujarati is one dimension of your social identity in the same way as being a Hindu, Muslim, Sikh or a Christian or being a teacher, farmer or lawyer.

Activity 2

Are you the same person that you were five years ago? Reflect on this for some time, and write your views and the reasons for these views in the space below.

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The self is thus multi-dimensional in nature. It also undergoes change as a person grows and develops from an infant to an adolescent. The next chapter describes the characteristics of self during infancy, childhood and adolescence.

Key Terms

Self, Self-concept, Self-esteem, Identity

REVIEW QUESTIONS

1. Explain what you understand by the term 'self'. Discuss its various dimensions giving examples.
2. Why is it important to understand the self?

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B. Development and Characteristics of the Self

2

The self is not something that you are born with, but which you create and develop as you grow. In this section we will read about the development and characteristics of the self in infancy, early childhood, middle childhood and adolescence.

2B.1 Self during Infancy

At birth we are not aware of our unique existence. Does that surprise you? This means that the infant does not realise that she/he is separate and distinct from the world outside – she/he has no **self-awareness** or **self-understanding** or **self-recognition**. By each of these terms we mean the mental representation (a mental picture) of the self. The infant brings her/his hand in front of her/his face and looks at it but does not 'realise' that the hand belongs to her/him and that she/he is separate from other people and things she/he sees around her. The sense of self emerges gradually during infancy and self-image recognition happens around 18 months of age. One interesting experiment which has been carried out with infants in the age range 14-24 months is described below. You can try it out too.

Activity 1

Put a dot of red lipstick/colour on the cheek of the infant and then place the infant in front of the mirror. If the infant has an awareness of the self, she/he will touch her own cheek after looking at the red spot on the face in the mirror. If the infant does not have self-awareness, she/he will touch the reflection in the mirror, or just play with the reflection in the mirror as if it is another infant.

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Towards the latter half of the second year, infants begin to use the personal pronouns – I, me and mine. They use these pronouns to indicate possession of persons or objects – "my toy" or "my mother"; to describe themselves or actions they are doing or their experiences – "me eating". Infants also begin to recognise themselves in photographs at this time.

2B.2 SELF DURING EARLY CHILDHOOD

Since children are able to talk quite fluently by the time they are 3 years old, we need not rely only on self-recognition to know young children's self-understanding. We can use verbal means by involving them in conversations about themselves. Researchers have found that the following are the five main characteristics of young children's understanding of themselves.

1. They use **physical descriptions** of their self or material possessions to differentiate themselves from others – they may use descriptive words like 'tall', or 'big' or refer to the clothes they wear or the toys or objects they have. Their self-descriptions are in absolute terms – this means they do not see themselves in comparison with others. To give an example, instead of saying, "I am taller than Kiran", the child will say, "I am tall."
2. They describe themselves in terms of **things they can do**. For example, in terms of their play activities – "I can ride a cycle"; "I can make a house"; "I can count". Thus, their self understanding contains active descriptions of themselves.
3. Their self descriptions are in **concrete** terms – i.e., they define themselves in terms of things they can do or what is visible to them – "I have a television."
4. They often **overestimate themselves**. Thus, a child may say, "I am never scared" or "I know all the poems", but may not remember them completely.
5. Young children are also **unable to recognise** that they can possess different attributes – that they can be 'good' and 'bad', 'mean' and 'nice' at different points in time.

The following is a brief interaction between an adult and Radha, a girl aged 3 years 8 months, which reveals the child's perception of herself. The

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interaction is presented in the form of questions asked and the answers given by the child.

वयस्क	अपने बारे में कुछ बताओ।
Adult	Tell me something about yourself
राधा	मैं खाना खाती हूँ, मैं गाजर भी खाती हूँ, रोटी भी खाती हूँ। मैं बैट-बॉल खेलती हूँ। तीन दिन बाद मेरा जन्मदिन होगा क्योंकि जनवरी में मेरा जन्मदिन है। मैं लाइन में खड़ी होती हूँ। मैं मम्मी के साथ पढ़ती हूँ।
Radha	I eat food, I eat carrots as well, I eat *chappati* also. I play with bat and ball. After three days is my birthday because my birthday is in January; I stand in a line; I study with my mother.
वयस्क	अगर कोई तुमसे पूछे कि राधा कैसी बच्ची है, तो तुम क्या कहोगी?
Adult	If someone asks you 'What is Radha like', what would you say?
राधा	मैं अच्छी हूँ क्योंकि मैं लिखती भी हूँ। (वयस्क ने और बताने को कहा पर बच्ची ने कुछ नहीं कहा)
Radha	I am good because I write as well. (The adult asked her to explain more but she did not respond).
वयस्क	तुम्हारे मम्मी-पापा को तुम्हारे बारे में क्या अच्छा लगता है?
Adult	What do your mummy-papa like about you?
राधा	मैं अच्छी-अच्छी बातें करती हूँ और अच्छी-अच्छी कहानी सुनाती हूँ।
Radha	I talk about nice things – I tell good stories.
वयस्क	तुम्हें अपने बारे में क्या अच्छा लगता है?
Adult	What do you like about yourself?
राधा	मेरे गुलाबी जूते अच्छे लगते हैं, बेबी अच्छा लगता है, अपनी सहेलियाँ अच्छी लगती हैं...
Radha	I like my pink shoes, I like baby, I like my friends…
वयस्क	और बताओ...?
Adult	Tell me more…?
राधा	मुझे समझ नहीं आ रहा... मुझे अपने बारे में कुछ नहीं पता...।
Radha	I don't understand… I don't know anything about myself…

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2B.3 Self during Middle Childhood

During this period, children's self-evaluations become more complex. There are five key changes that characterise this increasing complexity:

1. The child shifts towards describing herself in terms of her **internal characteristics.** The child is more likely to name her/his psychological characteristics (such as preferences or personality traits) in her self-definition and less likely to name physical characteristics. Thus, the child may say, "I am good at making friends", "I can work hard and finish my homework on time."
2. The child's descriptions include **social descriptions and identity** – they may define themselves in terms of groups they belong to, "I am in the music choir in school".
3. Children begin to make **social comparisons** and differentiate themselves from others in comparative rather than absolute terms. Thus, they begin to think about what they can do in comparison with others, for example, "I can run faster than Kiran."
4. They begin to **distinguish between their real self and ideal self**. Thus they can differentiate between their actual competencies and those that they want to have or those which they think are most important.
5. The self-descriptions become more **realistic** as compared to those of the pre-school child. This may be because of the ability to see things and situations from the point of view of others.

2B.4 Self during Adolescence

Self understanding becomes increasingly complex during adolescence. Adolescence is also seen as a critical time for identity development. What are the characteristics of this more complex self understanding? Let us discuss the first two aspects and then we shall discuss the features of the adolescent's self.

Activity 2

Make friends with a 5-year-old, a 9-year-old, and a 13-year-old. Ask them to describe themselves and note what they say. Do you find that their self-descriptions correspond with what you have read in this section?

Why is adolescence a critical time for identity development?

According to a well-known psychologist Erik H. Erikson, at each stage of our development, from infancy to old age, we have to accomplish certain tasks which enable us to move on to the next stage of development. For example, a task during late infancy and early childhood (between 2-4 years

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of age) is to achieve bowel and bladder control. Without this, participation in most social and community activities would become impossible for the child. The task during the period of adolescence, according to Erikson is to develop a sense of identity, a satisfactory self-definition.

The reason why the stage of adolescence is critical for identity development is because there is an enhanced focus on the development of the self. It is believed that the adolescent faces an identity crisis. This is because of three reasons—

1. This is the time when the person, more than at any other point of her/his life before this, is preoccupied with trying to know oneself. This means that the person is intensely concerned with understanding herself/himself.
2. Towards the end of adolescence the individual creates a relatively lasting sense of selfhood and identity and can say – "This is who I am".
3. This is also the time when the individual's identity is influenced by rapid biological changes and changing social demands.

Let us understand this in more detail

The adolescent is now expected to behave in an adult-like manner and begin to take on responsibilities related to family, work or marriage. This social transformation from dependent child to independent person occurs differently in different cultures. Western cultures generally emphasise independence in terms of 'separation' from parents (both physical and psychological). On the other hand, non-western cultures, such as the Indian, focus on interdependence within the family. In all cultures, however, adolescence is reported to be accompanied by dilemmas and disagreements. For instance, it is common to see that an adolescent may rebel against being treated "like a child" but at the same time may herself/himself seek comfort as a child would. The parents too may often tell the adolescent to "behave like a grown up", but their other actions may indicate to the adolescent that they do not think that she/he is quite grown up. This may be somewhat different for girls and boys depending on the expectations of the family, in a particular culture. Thus, the adolescent herself experiences conflicting feelings and also receives conflicting messages and social expectations from the people around her/him. You may have experienced this for yourself. For example, the family members may expect you to behave in an adult-like manner in social situations as far as talking or dressing is concerned, but may still think you are too young to discuss the family budget.

Since individuals are different they may respond differently to situations. The conflicting expectations from familial and societal sources, one's own changing needs and conflicting emotions may interfere with integrating

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the newly emerging selves during adolescence. Thus, the adolescents may experience what is known as role confusion or identity confusion. They may show behaviours like the inability to concentrate on the work at hand, difficulty in starting or finishing work on time, and a general difficulty in coping with schedules. It is important to stress that the difficulties that the adolescent experiences in the process of developing an identity are a **normal part of development** – there is nothing inappropriate with the contradictory feelings and emotions the adolescent experiences during this period. The feeling of identity crisis or role confusion arises when the adolescent feels that there is a significant gap in terms of what she/he is expected to do and how she/he is expected to behave as compared to earlier times. However, for many adolescents, especially those who are involved in family occupations, this sense of break may not be distinct and may not cause much emotional upheaval. For example, if a child in a village is assisting the family in agriculture, her/his role does not change much from when she/he was 12 to when she/he is 16, except may be in terms of being given more responsibility.

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The following are the characteristics of an adolescent's sense of self.

1. Self-descriptions during the period of adolescence are **abstract**. Adolescents are likely to lay less emphasis on describing themselves in physical terms as "tall", or "big"; they emphasise the abstract or inner aspects of their personality. Thus, they may describe themselves as quiet, sensitive, cool headed, brave, emotional or truthful.

2. The self during adolescence carries several **contradictions**. Thus, adolescents may describe themselves as "I am calm but get easily disturbed" or "I am quiet and also talkative."
3. The adolescent experiences a fluctuating sense of self. As adolescents experience diverse situations and respond to different experiences, their understanding about their own self fluctuates over situations and over time.
4. The self of the adolescent contains 'the ideal self' and 'the real self'. The ideal self becomes more prominent now. Each one of us has an idea of what and how one would ideally like to be. This could be called the ideal self, towards which we would like to develop. For example, a girl may want to be tall but is actually quite short.
5. Adolescents, more than children, are self-conscious and preoccupied with themselves. This gives them a feeling of always "being on stage" – a feeling that they are always being noticed. This is the reason why most adolescents are over-concerned about their physical appearance.

We now know about the different characteristics of self during certain life stages. But how do we develop a sense of self in the first place? What influences the development of a person's identity? The next chapter focusses on this aspect.

ACTIVITY 3

Do you feel that you are experiencing any of the feelings and thoughts we have described above? Do you feel you are able to handle these feelings or do you experience confusion? Have you discussed these aspects with your friends or family members? Talk to your friend about it.

Key Terms

Infancy, Early childhood, Middle childhood, Adolescence, Identity development, Real vs. Ideal self

REVIEW QUESTIONS

1. Describe, giving examples, the characteristics of the self during—
   – infancy
   – early childhood
   – middle childhood
   – adolescence
2. "Adolescence is a time when all adolescents experience identity crisis". Do you agree with this statement? Give reasons for your answer.

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C. Influences on Identity
How do we Develop a Sense of Self?

2

You have read that we are not born with a sense of selfhood or identity. How does it develop then? How does it evolve and change over time? The self develops as a result of what you learn about yourself through the experiences you have and through what others tell you about yourself. Each person lives in a web of relationships – these relationships are in the family, school, workplace and community. The sense of self develops as a result of interaction with the people around you and through your actions. Thus multiple people shape the development of your self and the construction of the self is a continuous dynamic process. The word 'construction' implies that the self is not something that you are born with but which you create and develop as you grow.

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Activity 1

Recall any significant experience you have had. Did it influence the way you think about yourself? Note your observations in the space below.

.....

.....

.....

.....

.....

.....

Let us trace how the sense of self develops from the early years. From the earliest days, parents address the children by a particular name or names in a variety of situations. The children begin to associate the name with themselves. Along with this they also point to the child in the mirror

and in photographs with that name. They use the pronouns 'you' and 'your' and when they are able to speak, the use of the pronouns 'me' and 'mine' appears. The child understands that 'you' and 'your' refer to another person. Parents play various 'body games' pointing and labeling various parts of the child's body and ask the child to point out body parts in turn. All this helps the child to gradually learn to see herself/himself as distinct and separate from others.

Second, as the child grows during infancy she begins to realise that her actions have an effect on the environment. For example, when she touches a toy it moves. All such experiences help her/him have a sense of being separate from other people and objects around her. If you recall the earlier discussion, this is also the time (around 18 months) when the child is able to identify that the spot of red is on her/his face and she/he does not treat the reflection in the mirror as another child.

Third, as the child grows older and can talk, the parents encourage the child to provide self–statements and ask her/him to give reasons. They ask the child, "Why did you do this?" or "How do you feel?" These questions help the child understand what she or he is experiencing or the reasons for certain actions; in this way they help the child in defining the self.

Fourth, during the course of the day the child has several encounters with people and objects around her/him which help to develop an idea about abilities. People also give the child a feedback about her or his behaviour and abilities. To a 6-year-old who helps in cleaning up the food area after the meal, the father may say, "That was a good thing to do. You are a good boy." All this feeds into the child's beliefs about herself/himself. The child thus constructs and re-constructs selfhood and sense of identity through the verbal-social interactions she/he has with caregivers and others.

Developing a sense of self and identity

The reasons why each one of us has a unique identity is because

- each one of us (except identical twins) has a unique combination of genes.
- each one of us has different experiences.
- even if we have similar experiences, we respond to these in different ways.

In this section we will study the influences on the formation of identity. These can be classified as—

- Biological and physical changes
- Socio-cultural contexts including family and peer relationships
- Emotional changes
- Cognitive changes

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2C.1 Biological and Physical Changes

The period of adolescence is marked by certain universal physical and biological changes in the body which take place in particular sequences. These changes lead to the attainment of sexual maturity. The time when sexual maturity is reached is called **puberty**. Menarche (first menstruation) is usually considered the point of sexual maturity for girls. There is no corresponding definite event marking puberty for boys, although a criterion sometimes used is the production of spermatozoa. Puberty occurs at different average ages in different cultures. A criterion of puberty that has been found useful for both boys and girls is that of maximum yearly increase in height. The age of most rapid growth comes just before menarche for girls and before certain adult characteristics in boys. This period during which physical and biological changes occur, leading to puberty is called **pubescence**. For most girls this period ranges from 11 years to 13 years, and for boys it is 13 years to 15 years. Following is the list of changes in girls and boys showing normal sequence for development during pubescence.

Girls	**Boys**
Initial enlargement of breasts	Beginning growth of testes
Straight, pigmented pubic hair	Straight, pigmented pubic hair
Kinky pubic hair	Early voice changes
Age of maximum growth	First ejaculation of semen
Menarche	Kinky pubic hair
Growth of axillary hair	Age of maximum growth
	Growth of axillary hair
	Marked voice changes
	Development of the beard

While the physical changes that take place in the body with the onset of puberty are universal, the psychological and social impact of these changes on the person vary from culture to culture and within a culture from person to person. We will discuss these aspects under the next two headings – socio-cultural contexts and emotional changes.

2C.2 Socio-cultural Contexts

It has been stated that physical changes in the body and the changing social expectations are the two main aspects that influence the process of identity formation during the period of adolescence. But to what extent these physical and social changes impact the process of identity formation varies with cultural, social and familial contexts. In this section, let us first see how cultural and social contexts influence adolescent development and then we will read about the influence of the family.

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Different sections of the society may respond differently to the physical changes during adolescence. In traditional Indian society, the onset of puberty places many restrictions on the girls while the boys retain their freedom of movement. Certain avenues of entertainment or work are not seen as appropriate for girls. The elements of the self and the identity of a girl from a traditional community would be very different from that of a girl living in urban areas.

Let us now compare our culture with Western cultures. In most Western cultures (such as the U.S. and U.K.) adolescents are expected to be fairly independent — in many cases they are expected to move away from the family to set up their own home. In the Indian context, a large majority of adolescents continue to be fairly dependent on parents as they are expected to be, and the family continues to exercise control over them. While many adolescents in India, especially in rural and tribal settings, begin to contribute towards the family income, and in this sense begin to assume adult roles, yet they do not break away from the family. Instead their efforts at earning are often aimed at the welfare of family members. The development of the self of an adolescent in these two cultural settings would be quite different. Even within India, the experiences of adolescents would be quite different in different communities. In traditional communities and regions where technology is not yet advanced and where occupational opportunity and choices for alternative lifestyles are limited, children are trained in the traditional family occupations, such as weaving, up to the time they reach adolescence. Such adolescents are, therefore, ready to assume adult roles – this means they are seen as persons with responsibilities of beginning work, getting married and bearing children, like adults. Thus, in these communities the identity of the adolescent would be drawn more from familial sources. The adolescent may not enter into much conflict with elders since they are largely doing what adults expect of them. As a result, there are likely to be fewer confusions and doubts while developing a sense of self. On the other hand, in communities and families where a variety of occupational choices are open for the adolescent, where technology makes available many experiences and options to the individual, the adolescent may need to enter into an extended period of training to prepare herself/himself for the chosen occupation. During this period the adolescent still remains dependent on the parents. While the period of adolescence is thus extended, that of adulthood is delayed. Also, the increase in choices and exposure to alternate lifestyles may bring the adolescent in conflict with parents and other authority figures in society.

There is another reason why the development of identity is likely to vary in traditional cultures and cultures of the West. In traditional Indian communities, open reflection on oneself and the idea of talking about oneself is not a common activity among adolescents. In fact, such an attitude is often neither encouraged nor tolerated. Many Indians define themselves

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primarily in one or the other roles that they play – son/ daughter, mother/ father, sister/brother. To put it differently, they often speak of themselves in terms of the family and the community – as "we" – rather than as "I". For example, while talking about her views on marriage, an adolescent girl would say, "In our family marriages are arranged by parents", rather than saying, "I would prefer my parents to arrange my marriage". Thus we can see how important the socio-cultural context is in the construction of a sense of self. Of course the impact of these cultural influences will vary from family to family and person to person.

Having discussed how the culture and society impact adolescent identity development, let us read how the family can impact the development of the sense of identity. During adolescence identity formation is enhanced by family relationships where adolescents are encouraged to have their own point of view and where there is a secure relationship between family members which provides the adolescent with a secure base from which to explore her widening social world. It has also been found that firm and affectionate parenting fosters healthy development of identity. 'Affectionate' parenting means that the parents are warm, loving and supportive of the child's effort and accomplishment. They often praise the child, show enthusiasm in her/his activities, respond sensitively to her/ his feelings, and understand the child's personality and points of view. However, such parents are also firm in disciplining. Such parenting style fosters independence and self-reliance in children.

Adolescence is the period in which the growing individual develops a strong need for support and acceptance from the peers. At times, parental and peer values can be in conflict with each other and the adolescent may tend to lean more towards friends. This can cause disharmony in parent-child relationships. Conforming to peer pressure can be both positive and negative. The negative effects become evident when adolescents indulge in harmful behaviours such as smoking or consuming, drugs or alcohol or bullying. However, often peers and parents serve complementary functions and fulfil different needs of the adolescents. It has been seen that a family atmosphere that promotes both **individuality** and **connectedness** is important for the identity development of the adolescent. By '**Individuality**' implies greater opportunity and the ability to have one's own point of view. '**Connectedness**' suggests greater sensitivity to and respect for others' views and openness to others' views.

2C.3 Emotional Changes

The adolescent experiences many emotional changes in the process of growing up. Many of these changes are a consequence of the biological and physical changes that the adolescent is undergoing. It is true that adolescents are preoccupied with their physical body. They imagine that

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others are noticing each and every aspect of their body and behaviour. A young person with pimples on the face may feel that everyone is first and foremost noticing that. However, there are individual differences in the way adolescents react to the bodily changes. A boy who does not have adequate growth of facial hair as compared to all the other boys of his age may feel peculiar about it. However, this same lack of facial hair may not disturb another boy. A sense of pride or comfort with the way one is developing physically will contribute positively to the adolescents' sense of self. On the other hand, if the adolescent is dissatisfied with one's appearance beyond a point, it can prevent from concentrating on other aspects of her/his personality, work or studies. This can cause a dip in performance at school and a lowering of self-image or self-esteem. A negative self-image can cause a person to feel insecure and also generate negative feelings about the body. An adolescent with a physical disability may not experience herself/himself as any less than others, whereas a well-built adolescent boy may feel conscious and inadequate because he feels that his body is not "good enough".

The adolescent also experiences mood swings – for example, desiring the company of family members and friends at one time and wanting to be alone at other times. There may also be sharp bursts of anger. A lot of this happens as the adolescent is trying to make sense of and understand the variety of changes she/he is experiencing at different levels.

2C.4 Cognitive Changes

You will read in detail about the changes in thinking (cognition) that takes place from infancy to adolescence in Unit III titled 'Childhood'. At this point we are briefly describing the cognitive changes that have an impact on the development of the sense of identity.

The child develops from a person who has no sense of a separate identity or sense of the individual self to one who describes the self in concrete and absolute terms during early childhood years. While the self-descriptions during middle childhood are also concrete, the difference is that these descriptions are now in comparative terms. By the time the child is 11, the self descriptions are fairly realistic enabling the child to differentiate between the 'real' and the 'ideal' self.

During adolescence, the leap that takes place is that adolescents can think in abstract terms, i.e., they can think beyond what is present and what they see and experience. Further, as thought becomes flexible, they can think of hypothetical situations — in other words, they can imagine the various possibilities and their outcomes without necessarily having to go through them or act out the steps of any outcome. The implication for identity formation is that adolescents can imaginatively link up their present with a future they imagine for themselves. For example, the

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adolescent can think of the possible careers that she/he can take up as an adult which are suited to her/his situation and temperament, and plan the current direction of her/his studies accordingly.

Thus, adolescence is a crucial stage for the development of identity. In fact, adolescence is a significant period of development involving many changes and opportunities. If the adolescent is healthy, she/he is able to deal with the changes in the best possible manner and realise one's full potential. Appropriate food and nutrition are the key elements of good health. The next chapter discusses food, nutrition, health and fitness concerns during adolescence.

Key Terms

Puberty, Pubescence, Menarche, Personality, Peer pressure

REVIEW QUESTIONS

1. Discuss the concepts of puberty and pubescence. Explain the major physical and biological changes in girls and boys during puberty.
2. What is the role of family in shaping the personality of the adolescent?
3. To what extent does culture shape the adolescent identity? Explain with examples.
4. List the major emotional and cognitive changes during adolescence.

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Practical 1

Development and Characteristics of the Self

Theme Study of one's physical self

Tasks
1. Recording of height, weight, hip size, round waist, round chest/bust
2. Recording of age of menarche (girls) and growth of beard and change in voice (boys)
3. Recording of colour of hair and eyes

Purpose of practical: You have read about physical growth and development during the age of adolescence. This practical will help you to understand your physical self better and also help you to know the average rate of growth and development of adolescents in your region as you compare your data with those of others. The measurements stated in Task 1 above are also important for you to know for the purpose of garment sizing–

Conduct of practical: Take your own measurements as stated in Task 1 above. Alternatively you can take each other's measurements in the class. The following measurements can be taken as described–

- Around Hip: Use a measuring tape around the widest portion of the hips with two fingers between the tape and the body.
- Around Bust/Chest: Hold the tape and measure across the fullest part of the bust/chest. Hold tape firmly but not tight.
- Around Waist: Hold the tape around waist and let it settle into the smallest portion of the body (that is the waistline). Take the measurement with one finger between tape and body.
- Around neck: Lay a still measure tightly around the neck and gently tap it down until the lower edge settles at the base of the neck where the measurement is taken.
- Across back: It is measurement taken between the lateral ends of scapulae (shoulder blades). Take one more measurement 10–12 cms below the waist measurement over the fullest part of back.

Record information required as per Tasks 1, 2 and 3 in the table below:

Your name	.....	Age	.....
Gender	.....	Colour of hair	.....
Colour of Eyes	.....	Age at menarche	.....
Age at growth of beard, change in voice	.....	Weight	.....
Height	.....	Around chest/ bust	.....
Hip size .	.....	Around neck	.....
Around waist	.....	Across back	.....

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Now form yourself into groups of 10 students each and pool all your individual data together.

1. Note what the range is for each of the above measurements of the body in your group. For example, weight in your group ranges from ……kgs to …..kgs.
2. Note the range for age of menarche and the range during which growth of beard and change in voice takes place.
3. Correlate the size of ready-made garments you purchase with your measurement.

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Practical 2

Influences on Identity

Theme Emotions experienced by self
Tasks 1. Making a record of your emotions experienced during a day
2. Reflecting on the reasons for experiencing the emotions
3. Identifying ways of handling them

Purpose of the practical: We all experience a variety of emotions each day and these influence the way we respond to situations. Being more aware of our emotions and the reasons for feeling the way we do, can help us to manage them better and respond appropriately to situations. This practical has been designed with this objective in mind.

Conduct of practical: Identify a particular day and bring to your awareness the emotions you experience since morning during that day. Keep a notepad and pen with you and record the emotion, the context situation and the reason for the emotion as soon as you become aware of it. You can use the following table for recording.

Time of the day				
Emotion				
Situation / context				
Your reaction on experiencing the emotion				
Specific comment or observation you wish to note				

Make groups of 4-5 students per group and in your group compare your notes with those of others. Discuss the following:

1. Whether similar emotions were experienced by other group members?
2. The common features in the various situations that lead to the group members experiencing these emotions.
3. Whether each person handled the emotions appropriately?
4. Could there have been alternate ways of handling the emotions?

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Food, Nutrition, Health and Fitness

3

Learning Objectives

After completing this chapter the learner will be able to —

- define the terms — food, nutrition, nutrients, health, fitness and the role of food and nutrition in maintaining health.
- understand the term, balanced diet and apply the concept in planning and consuming diets.
- understand the basis for defining the Recommended Dietary Allowances (RDAs) and the difference between Dietary Requirement and RDA.
- understand the basis for classifications of foods into appropriate groups.
- analyse the factors which influence adolescent food habits.
- identify the causes, symptoms and nutritional interventions related to eating disorders.

3.1 Introduction

The onset of adolescence brings with it many profound changes. The growth rate speeds up dramatically. This growth spurt occurs due to the activity of hormones that affect every organ of the body and this makes healthy eating very important. The nutrient needs rise throughout childhood, peak in adolescence and then level off or even diminish as the teenager becomes an adult. The saying "You are what you eat" seems to be proven true. We eat different kinds of food such as *dal*, chapatti, bread, rice, vegetables, milk, *lassi*, etc. All these different kinds of food provide us with nutrients to keep us healthy and active. It is important to know what food to eat in order to stay healthy. The science of food and nutrients and their action on our health is called **Nutrition**.

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Nutrition and health, in fact, are two sides of the same coin. They are, therefore, inseparable. Health depends to a large extent on nutrition, and nutrition depends on the food intake. So **food**, is the most important single factor for health and fitness.

Let us define and describe food, nutrition, health and fitness

- **Food** can be defined as anything solid or liquid which when swallowed, digested and assimilated in the body provides it with essential substances called nutrients and keeps it well. It is the basic necessity of life. Food supplies energy, enables growth and repair of tissues and organs. It also protects the body from disease and regulates body functions.
- **Nutrition** is defined as the science of foods, nutrients and other substances they contain; and of their actions within the body including ingestion, digestion, absorption, metabolism and excretion. While this summarises the physiological dimensions, nutrition has social, psychological and economic dimensions too.
- **Nutrients** are the constituents in food that must be supplied to the body in suitable amounts. These include carbohydrates, proteins, fats, minerals, vitamins, water and fibre. We need a wide range of nutrients to keep ourselves healthy. Most foods contain more than one nutrient such as milk has proteins, fats, etc. Nutrients can be classified as macronutrients and micronutrients on the basis of the required quantity to be consumed by us everyday. The figure on the next page shows us the distinction between macronutrients and micronutrients.

3.2 BALANCED DIET

A balanced diet is one which includes a variety of foods in adequate amounts and correct proportions to meet the day's requirements of all essential nutrients such as proteins, carbohydrates, fats, vitamins, minerals, water, and fibre. Such a diet helps to promote and preserve good health and also provides a safety margin or reserve of nutrients to withstand short durations of deprivation when they are not supplied by the diet.

The safety margin takes care of the days we fast, or the short-term deficiency of certain nutrients in the daily diet. If the balanced diet meets the Recommended Dietary Allowances (RDAs) for an individual, then the safety margin is already included since RDAs are formulated keeping extra allowances in mind.

Recommended Dietary Allowances = Requirements + Margin of safety

A balanced diet takes care of the following aspects.

1. Includes a variety of food items
2. Meets the RDA for all nutrients
3. Includes nutrients in correct proportions

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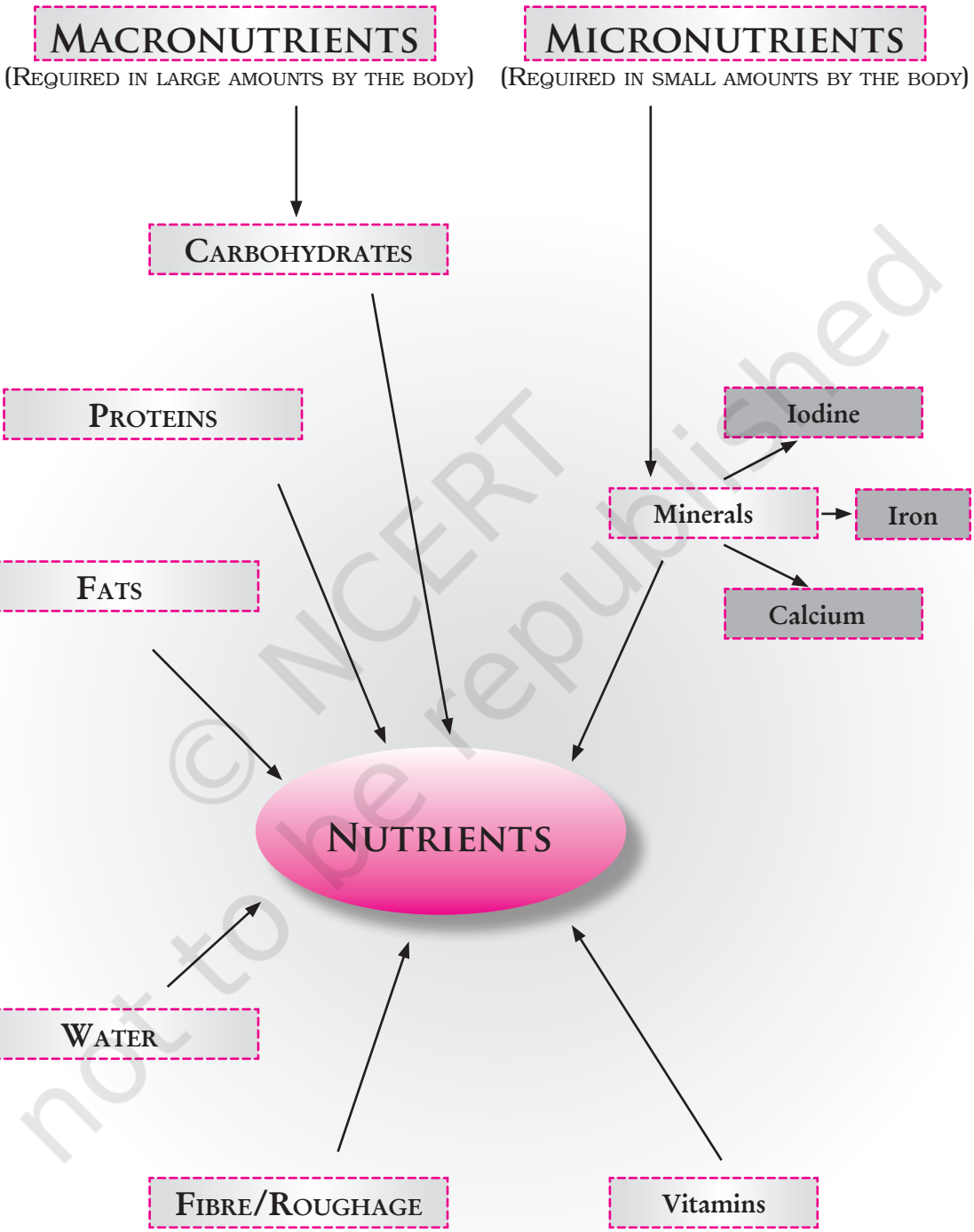

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Figure 1: Basic Nutrients in Our Food

4. Provides a safety margin for nutrients
5. Promotes and preserves good health
6. Maintains acceptable body weight for height

3.3 Health and Fitness

According to World Health Organisation (WHO) "**Health** is the state of complete physical, emotional, and social well-being, not merely the absence of diseases or infirmity." This definition has remained unchanged since 1948.

All of us want to maintain positive health, i.e., a perfect blend of physical, social and mental. Taking adequate amounts of essential nutrients in our diet is necessary to maintain positive health.

Physical health is probably the most easily understood aspect. Mental health can be defined as a **state of emotional and psychological well-being in which an individual is able to use her or his cognitive and emotional capabilities, function in society, and meet the ordinary demands of everyday life.** In other words, the absence of a recognised mental disorder is not necessarily an indicator of mental health. One way to assess mental health is to see how effectively and successfully a person functions. Feeling capable and competent, being able to handle normal levels of stress, maintaining satisfying relationships, and leading an independent life; and being able to 'bounce back' or recover from difficult situations are all signs of good mental health.

Physical fitness is good bodily health; it is the result of regular exercise, proper diet and nutrition, and proper rest for physical recovery. The term physical fitness is used in two ways: general fitness (a state of health and well-being) and specific fitness (a task-oriented definition based on the ability to perform specific aspects of sports or occupations). Physical fitness is the capacity of the heart, blood vessels, lungs, and muscles to function at optimal efficiency. Earlier, fitness was defined as the capacity to carry out the day's activities without undue fatigue. Automation, increased leisure time, and changes in lifestyles following the Industrial Revolution meant that this criterion was no longer sufficient. In the present context, optimum efficiency is the key.

Physical fitness is now defined as the body's ability to function efficiently and effectively in work and leisure activities, to be healthy, to resist diseases and to meet emergency situations. Fitness can also be divided into five categories: aerobic fitness, muscular strength, muscular endurance, flexibility, and body composition. Being fit prepares one to meet mental and emotional challenges. One feels strong and energetic if one is fit. Fitness provides one with the ability to meet routine physical demands with enough reserve energy to rise to a sudden challenge, such as running to catch a bus.

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Thus, health is a state of complete mental, physical and social well-being whereas fitness is the ability to meet the demands of a physical task. A well-nourished and fit person is better able to learn and has more energy, stamina, and self-esteem. A healthy eating pattern along with regular exercise will certainly help to remain fit. Teenagers between the ages of 12 and 18 who have unhealthy eating behaviours and are undernourished develop eating disorders.

3.4 Using Basic Food Groups for Planning Balanced Diets

One of the simplest ways to plan a balanced diet is to divide foods into groups and then make sure that each group is included in the meals. A food group consists of different foods which have common characteristics. These common features may be the source of food, the physiological function performed, or the nutrients present.

Foods can be grouped on the basis of the predominant nutrients present in them. This classification varies from one country to another depending on many factors. The five food group classification is used in India as a guide to meal planning. Many factors have been considered while compiling these groups such as availability of food, cost, meal pattern, and deficiency diseases prevalent. Not all foods in each group are equal in their nutrient content. That is why a variety of foods from each group should be included in the diet.

A classification based on nutrients present will ensure that all nutrients are made available to the body and offer greater variety within the group.

There are five basic food groups suggested by the Indian Council of Medical Research (ICMR). These include:

- Cereals, grains and products
- Pulses and legumes
- Milk and meat products
- Fruits and vegetables
- Fats and sugars

Activity 1

List 10 foods that you commonly eat. Identify the food group to which each food belongs. Then list the macronutrients and micronutrients present in the foods listed. Identify the foods which are the richest sources of energy.

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The five food groups are summarised in the table below:

Table 1: Five Food Groups

Food group		Main Nutrients Supplied
I. Cereals, Grains and Products Rice, Wheat, *Ragi, Bajra,* Maize, *Jowar,* Barley, Rice flakes, Wheat flour.		Energy, protein, Invisible fat, Vitamin – B1, Vitamin – B2, Folic Acid, Iron, Fibre
II. Pulses and Legumes Bengal gram, Black gram, Green gram, Red gram, Lentil (whole as well as *dals*) Cowpea, Peas, *Rajmah*, Soyabeans, Beans.		Energy, Protein, Invisible fat, Vitamin – B1, Vitamin – B2, Folic Acid, Calcium, Iron, Fibre.
III. Milk, Meat and Products **Milk** Milk, Curd, Skimmed milk, Cheese		Protein, Fat, Vitamin – B12, Calcium.
Meat Chicken, Liver, Fish, Egg, Meat.		Protein, Fat, Vitamin – B2

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IV. Fruits and Vegetables **Fruits** Mango, Guava, Tomato Ripe, Papaya, Orange. Sweet Lime, Watermelon.		Carotenoids, Vitamin – C, Fibre.
Vegetables (Green Leafy) Amaranth, Spinach, Drumstick leaves, Coriander leaves, Mustard leaves, Fenugreek leaves.		Invisible Fats, Carotenoids, Vitamin – B2. Folic Acid, Calcium, Iron, Fibre.
Other Vegetables Carrots, Brinjal, Ladies finger, Capsicum, Beans, Onion, Drumstick, Cauliflower.		Carotenoids, Folic Acid, Calcium, Fibre
V. Fats and Sugars **Fats** Butter, Ghee, Hydrogenated oils, Cooking oils like Groundnut, Mustard, Coconut.		Energy, Fat, Essential Fatty Acids
Sugars Sugar, Jaggery		Energy

Source : Gopalan, C., Rama, Sastri, B.V. & Balasubramanian, S.C. (1989). Nutritive value of Indian foods. Hyderabad. National Institute of Nutrition, ICMR.

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Remember
One gram of
- **carbohydrate releases 4 Kcal. of energy**
- **protein releases 4 Kcal. of energy**
- **fat releases 9 Kcal. of energy**

Guidelines for using the basic food groups

The five food group system can be used both for planning and assessing balanced diets. It is a simple daily food guide which can be used for nutrition education as well. Guidelines could be adopted depending on the food groups.

- Include at least one or a minimum number of servings from each food group in each meal.
- Make choices within each group as foods within each group are similar but not identical in nutritive value.
- If the meal is vegetarian, use suitable combinations to improve the overall protein quality of the diet. For example, serving cereal-pulse combinations or including small quantities of milk or curds in the meal.
- Include uncooked vegetables and fruits in the meals.
- Include at least one serving of milk to ensure a supply of calcium and other nutrients as milk contains all nutrients except iron, vitamin C, and fibre.
- Cereals should not supply more than 75 per cent of total Kcal/ Calories.

In planning balanced diets, food should be chosen from each group in sufficient quantity. Cereals and pulses should be taken adequately, fruits and vegetables liberally, animal foods moderately and oils and sugars sparingly.

Now let us look at the concept of the food guide pyramid.

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Food Guide Pyramid

The following figure (Figure 2) illustrates the food guide pyramid for Indians.

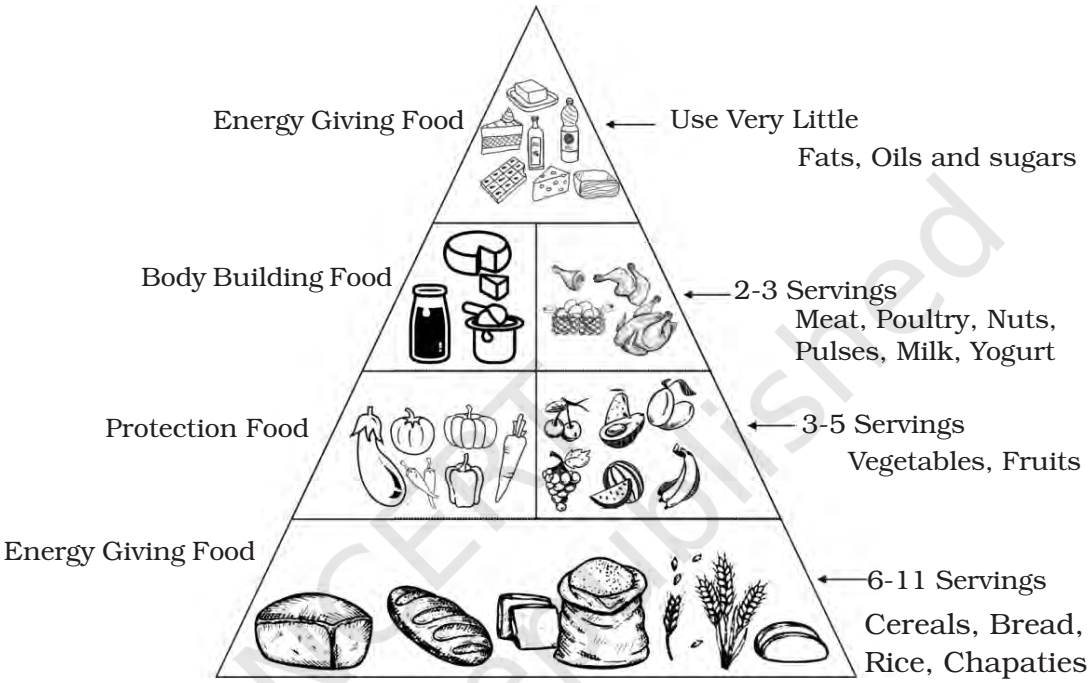

FIGURE 2: FOOD GUIDE PYRAMID

The food guide pyramid is a graphic depiction of the daily food guide. The illustration was designed to depict variety, moderation, and also proportions. The size of each section represents the number of daily servings recommended. The broad base at the bottom conveys the message that grains should be abundant and form the foundation of a healthy diet. Fruits and vegetables appear at the next level, showing that they have a less prominent, but still important place in the diet. Meats and milks appear in a smaller band near the top. A few servings of each can contribute valuable nutrients such as proteins, vitamins and minerals, without too much fat and cholesterol. Fats, oils and sweets occupy the tiny apex, indicating that they should be used sparingly.

Alcoholic beverages do not appear in the pyramid, but they too, if consumed, should be limited. Items such as spices, coffee, tea and diet soft drinks provide few, if any, nutrients, but can add flavour and pleasure to meals when used judiciously.

The daily food guide plan and food guide pyramid emphasise grains, vegetables, and fruits. These are all plant foods. Some 75 per cent of a

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day's servings should come from these three groups. This strategy helps all people obtain complex carbohydrates, fibre, vitamins, and minerals with little fat. It also makes diet planning for vegetarians easier.

3.5 Vegetarian Food Guide

Vegetarian diets rely mainly on plant foods: grain, vegetables, legumes, fruits, seeds, and nuts. Some vegetarian diets include eggs, milk products, or both. People who do not eat meats or milk products can still use the daily food guide to create an adequate diet. The food groups are similar and the number of servings remains the same. Vegetarians can select alternatives to meat such as legumes, seeds, nuts, tofu and for those who eat them, eggs. Legumes, and at least one cup of dark leafy greens, help to supply the iron that meats usually provide. Vegetarians who do not drink cow's milk can use soy 'milk' – a product made from soyabeans that provides similar nutrients if it has been fortified with calcium, vitamin D, and Vitamin B12 (i.e., these nutrients are added).

The food guide pyramid emphasises foods from the five food groups shown in the three lower sections of the pyramid. Each of these food groups provides some, but not all of the nutrients you need. Foods in one group cannot replace those in another. No one food group is more important than another – for good health you need all of them.

The pyramid is an outline of what to eat each day. It is not a right prescription, but a general guide that lets you choose a healthful diet that is right for you. The pyramid calls for eating a variety of foods to get the nutrients you need, and at the same time, the right amount of Calories to maintain a healthy weight.

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3.6 Dietary Patterns in Adolescence

Healthy eating is vital for the teenager's health and well-being. The nutritional needs of adolescents vary tremendously, but generally increase due to rapid growth and changes in body composition that occur during puberty. Adequate nutrition is vital for ensuring overall emotional and physical health. Good eating habits help prevent chronic illness in the future, including obesity, heart disease, cancer and diabetes.

Studies of nutrient intakes have shown that adolescents are likely to obtain less vitamin A, thiamine, iron, and calcium than recommended. They also ingest (consume) more fat, sugar, protein, and sodium than is currently thought to be optimal.

While concern is often expressed over the habit of eating between meals, it has been shown that teenagers obtain substantial nourishment from foods eaten outside of the traditional meals. The choice of foods they make is of greater importance than the time or place of eating. Emphasis

should be placed on fresh vegetables and fruits as well as whole-grain products to complement the foods high in energy value and protein that they commonly choose.

What are the commonly adopted eating habits of adolescents and why are they important to recognise? Understanding diet patterns will help us to be better prepared to evaluate the nutritional adequacy of diets and ensure that they are meeting the minimum requirements to maintain health and well-being. Among the more common eating idiosyncracies include skipping meals, consuming fast foods in a routine way, avoiding fruits and vegetables, snacking frequently and dieting. By addressing each of these issues individually you can ensure that you are meeting the minimum nutritional requirements.

Irregular meals and skipping meals: The numbers of meals teenagers miss and eat away from home increases from early adolescence to late adolescence, reflecting the growing need for independence and time away from home. The evening meal appears to be the most regularly eaten meal of the day. Girls are found to skip the evening meal, as well as breakfast and lunch, more often than boys. In some homes with limited resources, the adolescents may not even receive adequate number of meals or amounts, leading to nutrient deficiency.

Breakfast is frequently neglected and is omitted more often by teenagers and young adults under 25 years of age than by any other age groups in the population. A likely explanation as to why girls are more apt to miss breakfast than are boys is the pursuit of thinness and frequent attempts at dieting. Many teenage girls believe that they can control their weight by omitting breakfast or lunch. In fact, this approach is likely to accomplish just the opposite. By mid-morning or lunchtime they may be so hungry that they overcompensate for the "saved kilocalories." As a matter of fact, skipping breakfast can slow your metabolism contributing to weight gain and poor performance.

Snacking: Snacking is probably a survival technique for teens. Snacking does not have to be a bad habit. It can help maintain energy levels, particularly in active and growing adolescents. Many adolescents fail to eat three regular meals per day because of the 'skipping meal' factor. Thus snacking can actually be beneficial to ensure adequate intake of essential nutrients. However, surviving only on snacks is harmful to health.

Fast foods: Adolescents, particularly in urban areas, are more apt to eat fast food because it is convenient and typically a social affair, and they may believe it is the fashion of the day. Fast food is often packed with fat and "empty calories". We should make smart food choices even when visiting fast food restaurants. Table 2 provides important information about fast foods.

Dieting: Obesity is becoming a crucial problem among adolescents. Intervention is needed to maintain ideal body weight among the entire

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population. If this is not maintained, 80 per cent of them will stay overweight as adults. This can put them at risk for many medical problems, including diabetes, high blood pressure, high cholesterol and sleep apnea (a sleep disorder).

Table 2: Nutritional Limitations of Fast Foods

The following factors appear to be the major nutritional limitations of fast-food meals.
Calcium, riboflavin, vitamin A: These essential nutrients are low unless milk or a milkshake is ordered.
Folic acid, fibre: There are few fast food sources of these key factors.
Fat: The percentage of energy from fat is high in many meal combinations.
Sodium: The sodium content of fast food meals is high, which is not desirable.
Energy: Common meal combinations contain excessive energy when compared with the amounts of other nutrients provided.

Although fast foods can contribute nutrients to the diet, they cannot completely meet the nutritional needs of teenagers. Both adolescents and health professionals should be aware that fast foods are acceptable nutritionally when they are consumed judiciously and as a part of a well-balanced diet. But when they become the mainstay of the diet there is cause for concern. A nutrient imbalance may not appear to be a problem until a number of years have gone by, unless some specific problem such as a chronic disease exists. However, evidence is accumulating to show that food intake patterns of teenagers affect their health in later life.

However, adolescents with normal weight often diet because of the perception that "thin is in". Girls are bombarded with messages from the media about thinness, images of what is considered a beautiful body, and ways to achieve a lower body-weight. The images, in the context of a society that places a high value on physical beauty, sends mixed messages to teenagers and may result in unhealthy, unnecessary attempts to lose weight.

Dieting unsupervised by experts can lead to dangerous outcomes including eating disorders in teens. Some symptoms of dieting include: skipping meals, 'binge' eating, fasting or use of laxatives or diet pills. Consequences of such dieting include its possible association with cycles of weight loss and regain that increase the likelihood of developing eating disorders and obesity, lowered self-esteem and other psychological problems. This can lead to increased cardiovascular risk (heart problems) and possible mortality.

One approach to overcome the problems related to dieting is to attempt to eliminate the term 'diet' and replace it with 'healthy eating'. If you regularly incorporate healthy lifestyle and dietary practices into your life, you are less likely to diet on a consistent basis. Recognising good eating habits is the first step towards encouraging healthy diets. It is best to adopt a healthy lifestyle that incorporates sound eating habits and regular exercise.

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3.7 Modifying Diet Related Behaviour

As you have read in the chapter on 'Self', adolescence is a time when an individual begins to question authority and tries to establish her/his status. Eating behaviour is one of the mediums through which individuality may be expressed by adolescents. Thus, rejection of routine home food (which may be healthy) and eating outside (not so healthy), sometimes in order to conform to peer preferences, is not uncommon in adolescence.

It is easier for us to change lifestyle and diet patterns if we are convinced that we want to do so. What are the ways in which adolescents can modify their own behaviour? The next section tells us more about how to adopt healthy dietary practices.

Limiting television viewing: Television viewing should be limited to about one or two hours each day (this includes playing video games or using the computer). Watching television does not use up many Calories and it encourages eating erratically, since it is common to eat while watching TV. Overeating and under-eating is common among those who do it.

Healthy eating habits: Eat three balanced meals of average size each day, plus two nutritious snacks. One must try not to skip meals.

Snacks: Snacks should be limited to two each day and they can include low calorie foods, such as raw fruits or vegetables. Avoid using high calorie or high fat foods for snacks, especially potato chips, biscuits and fried foods. Of course, favourite snacks can be consumed once in a while, but this should not be made a habit.

Drinking water: Drinking four to six glasses of water each day, especially before meals is a good habit. Water has no calories and it will create a feeling of fullness. Avoid drinking soft drinks and fruit juices too frequently, as they are high in energy (150-170 calories per serving).

Diet journal: It helps to keep a weekly journal of food and beverage intake and also of the amount of time that is spent in watching television, playing video games and exercising. Recording body weight each week is a good practice.

Exercise: This is essential for healthy life. Participating in extra-curricular activities such as sports helps to keep activity levels high.

Some tips to increase physical activities include:

- Walk or ride a bicycle for short distances.
- Use stairs instead of elevators in a building.
- Do regular exercise for 20-30 minutes, 3-4 times each week. This can include walking, jogging, swimming or bike riding. Playing games and sports, such as skipping rope, hockey, basketball, volleyball, or football, and doing yoga are also advisable at all ages.

Substance use and abuse: Substance use and abuse in adolescence is a public health problem of major significance and concern. The substances

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most widely abused by adolescents are tobacco, alcohol, and marijuana and other addictive drugs. The abuse of drugs and alcohol has a harmful effect on the nutrition and health status of adolescents. Nutrition intervention, support, and counselling would play a major role in the physical and psychosocial rehabilitation process.

Much of what we have discussed may be more relevant for adolescents in urban and semi-urban areas. Rural environments would be different. Rural girls and boys are often engaged in agricultural tasks. They may also be helping their parents in enterprises such as poultry-keeping, cattle-rearing and bee-keeping. Boys may be helping in farming. Girls also help in looking after their younger siblings as well as cooking and cleaning while their parents earn livelihood. Then there are the tasks of collecting fodder for the cattle, firewood and water. In tribal areas many people are dependent on forest products like berries, flowers, leaves, roots. They spend time gathering and processing these products.

Girls and boys doing these tasks will have high activity levels and therefore, their energy needs will be higher. Protein needs are also higher due to the high growth rate at adolescence. The chances of adolescents being malnourished are, therefore, very high in rural areas among the poorer communities. Girls in particular are known to be anaemic (low iron in blood) and require iron rich foods to be healthy. Adolescents from rich families in rural areas would face many of the same problems as those in urban areas in the higher income groups. They would tend to be sedentary and enjoy rich food having plenty of fat and carbohydrate.

Adolescence and Anaemia

Anemia afflicts an estimated two billion people worldwide, mostly due to iron deficiency. It primarily affects women and girls. The latest National Family Health Survey-3 (NFHS-3) conducted in 2005-06 has revealed that 56 per cent of adolescent girls are anaemic as compared to 30 per cent of adolescent boys. Compare this with the figure of 70 per cent for young children in the age range 6-59 months. It has also been found that the incidence of anaemia is actually increasing when compared to the last survey conducted in 1991-92.

The prevalence of anemia is disproportionately high in developing countries like India, due to poverty, inadequate diet, certain diseases, repetitive pregnancy and lactation, and poor access to health services.

Adolescence is an opportune time for interventions to address anaemia. In addition to growth needs, girls need to improve iron status before pregnancy. Both boys and girls have access to information about anaemia through schools, recreational activities and via the mass media. This can be used effectively to transmit messages about iron-rich foods and iron supplements where necessary.

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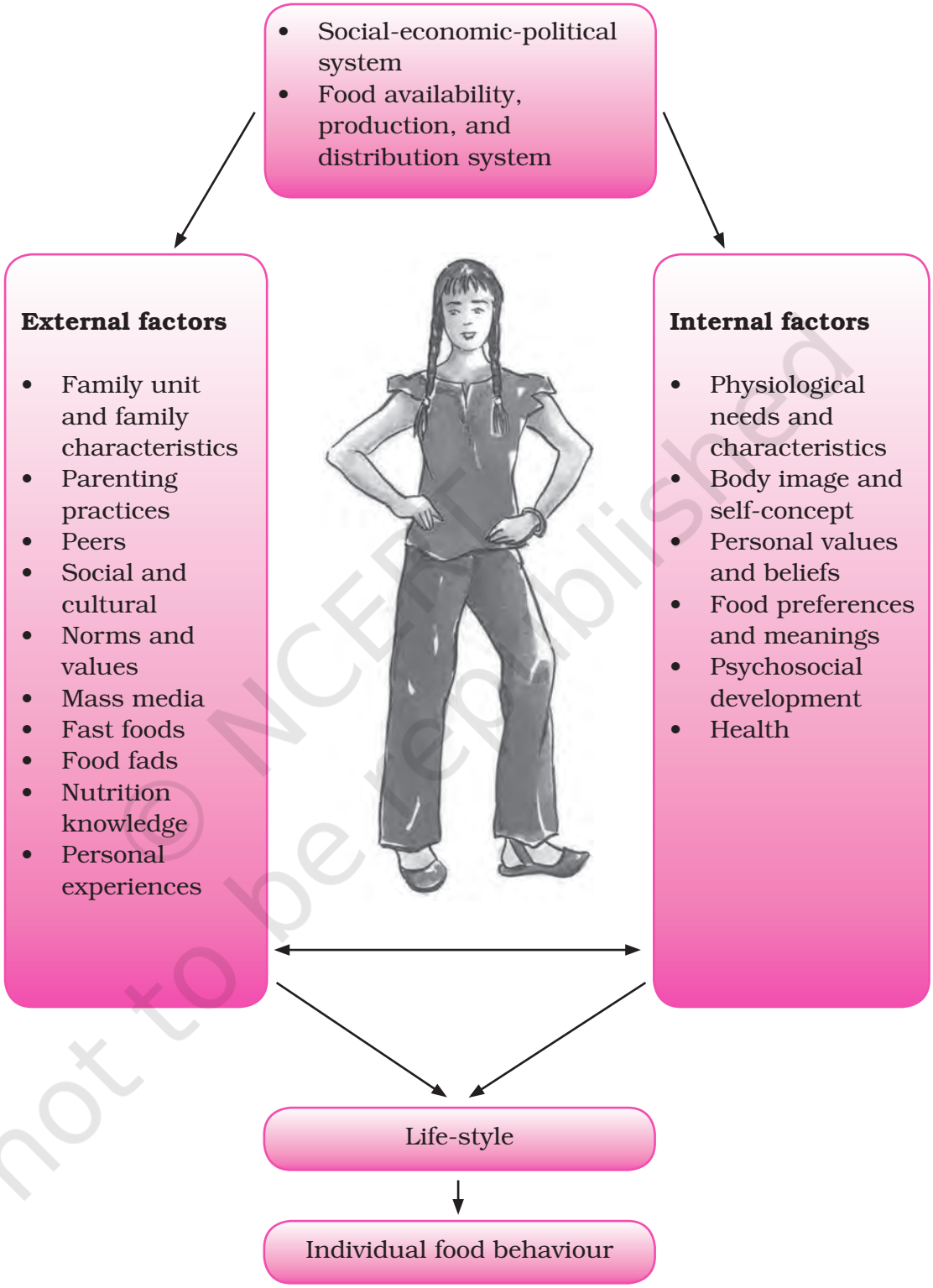

FIGURE 3: FACTORS AFFECTING FOOD BEHAVIOUR OF ADOLESCENTS

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3.8 Factors influencing eating behaviour

By the time a person reaches adolescence the influences on eating habits are numerous and the formation of those habits is extremely complex, as shown in Figure 3. The growing independence of adolescents, increased participation in social life, and a generally busy schedule of activities have a definite impact on what they eat. They are beginning to buy and prepare more food for themselves and they often eat rapidly and away from home.

In order to encourage adolescents to form reasonably healthy eating habits **parents** should give their children the opportunity to choose from a range of nourishing foods as they are growing up. By the time they are teenagers they will need some freedom to use the kitchen; this is true for boys as well as for girls.

While the basic foundation for eating habits is found in the family, many influences on eating behaviour originate outside the home. The influence of **peers** can be a useful source of support, as well as a source of stress for the adolescent. Peer influence and support can be helpful for overweight teenagers, although the same peers can also target such adolescents for teasing.

Teenagers are very vulnerable to advertising messages. **Television** food commercials and eating habits portrayed in programme content have influenced people for more than a decade. The majority of advertisements are for products with a high concentration of sweetness and fat. Hence, adolescents have to be discerning while consuming such food products.

The ease of obtaining food that is **ready to eat** also influences the eating habits of teenagers. Through home delivery/vending machines, at movies, melas and sporting events, at fast-food outlets and convenience groceries, food is available at numerous times throughout the day. Hence, adolescents may eat more often as well as more of not-so-healthy food stuffs. Watching this tendency is advisable.

3.9 Eating disorders at adolescence

Adolescence is associated with rapid physical growth and body-image development eating disorders are of special concern at this time. These changes intensify associated self-esteem problems. **Anorexia nervosa**, for example, is a disorder so tied to body image distortion that it is most commonly seen in adolescence, the period when a person is struggling with self-identity and most vulnerable to body image problems. Progress in adopting a normal adult body image will be interrupted for the teenager with an eating disorder.

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To understand anorexia nervosa let us take the example of Sonam. She aspires to have a perfect body. She has been ignoring the advice of her parents and teachers and almost stopped eating. She has become obsessed with having a very thin body. Although her current weight is normal, she feels pressured to be "ideally" thin like some actresses in movies or models in magazines. She has a low self-esteem and remains depressed, and this has resulted in her withdrawing from her family and friends. She is unaware that she is undernourished and insists that she is fat. She is a clear case of the eating disorder called anorexia nervosa. She is unaware that drastic loss of weight can even lead to death.

Bulimia is another type of eating disorder. Bulimia often begins in late adolescence or early adulthood after a series of various unsuccessful weight reduction diets. Those with bulimia indulge in bingeing (overeating) and inducing purging by vomiting or using laxatives. Although more common in females, about five to ten per cent of all eating disorders occur in males too.

Anorexia and bulimia can have serious consequences such as convulsions, renal failure, irregular heartbeats and dental erosion. In adolescent girls, anorexia can delay the onset of menstruation, permanently minimise stature and result in osteoporosis (weakening of bones).

Perhaps a person's best defense against these disorders is to learn to appreciate one's uniqueness. Respecting and valuing oneself will certainly be life saving. Important dietary interventions include ensuring balanced diets, enhancing dietary fibre intake and using nutrient/food supplements to make up losses.

To sum up, physical, social and emotional changes experienced during adolescence can profoundly impact the adolescent's nutritional status and eating patterns. Although young people are rarely motivated to learn about nutrition for the sake of longevity, learning how to apply sound dietary principles to reach our health goals can help build the foundation to a healthier life, now and in the future.

Health is a key resource of young people; it influences the availability and use of other resources that are important in everyday life. What are the other resources that an individual has? The following chapter on Management of Resources addresses this question and also discusses how best one can utilise and manage key resources such as time, energy and money.

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Key terms and their meaning

Activity level
Level of activity of a person, i.e., sedentary or light, moderate, and heavy. This is closely related to one's occupation.

Balanced diet
A diet which includes a variety of foods in adequate amounts and correct proportions to supply all essential nutrients which promote and preserve good health.

Food group
A number of foods sharing common characteristics which are grouped together. Characteristic for grouping may be function, nutrient, or source.

Lactation
The period when the mother nurses her infant.

Physiological state
State when nutrient needs increase because of normal physiological events such as pregnancy and lactation.

Recommended Dietary Allowances
Allowances of nutrients which cover the needs of practically all healthy individuals. These are not requirements for any individual but guidelines which tell us the amount of nutrients to be consumed daily.

Review Questions

1. Differentiate between the terms RDA and requirement.
2. Explain how the use of food groups simplifies planning of balanced meals.
3. List 10 foods which belong to the protective food group, stating reasons for your choice.
4. Discuss the factors that influence eating behaviour at adolescence.
5. Explain the two eating disorders that may arise at adolescence. What would be the best way to prevent their occurrence?

Practical 3

Food, Nutrition, Health and Fitness

1. List 10 signs of good health. Evaluate yourself using the following format.

Signs of good health	Rating of yourself		
	Satisfactory	Normal	Below normal
1.			
2.			
3.			

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4.			
5.			
6.			
7.			
8.			
9.			
10.			

2. Record your diet for a day. Evaluate each meal in terms of inclusion of the five food groups. Do you think the diet is balanced? Use the following format to write your response.

Meal/menu	Inclusion of five food groups	Comment on whether meal is balanced/not balanced

3. Interview members of your family such as your grandmother, mother or aunt to collect information about—
   (a) food taboos giving reasons why the taboos are followed.
   (b) food practices during fasting and festivity from the region of India to which you belong.
   (c) preparations during fasting.

Tabulate the information as follows.

Region	Occasion (nature of fast)	Preparation	Nutrients present

Give two inferences on the basis of the information tabulated.

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MANAGEMENT OF RESOURCES

4

LEARNING OBJECTIVES

After completing this chapter the learner is able to
- discuss the concept of a resource.
- identify various resources.
- classify resources into human and non-human.
- describe the characteristics of resources.
- explain the need for managing resources.
- analyse the management process.

4.1 INTRODUCTION

Everyday we carry out various activities. Think of any activity you do and you will find that to complete that activity you need one or more of the following.

- Time
- Energy
- Money for purchasing required material
- Knowledge
- Interest/Motivation
- Skills/Strengths/Aptitude
- Material goods like paper, pen, pencil, colours, etc.
- Water, air
- School building

All these – time, energy, money, knowledge, interest, skills, materials – are resources. Resources are anything which we make use of while carrying out any activity. They help us in accomplishing our goals. You may need more of a certain resource for a particular activity as compared

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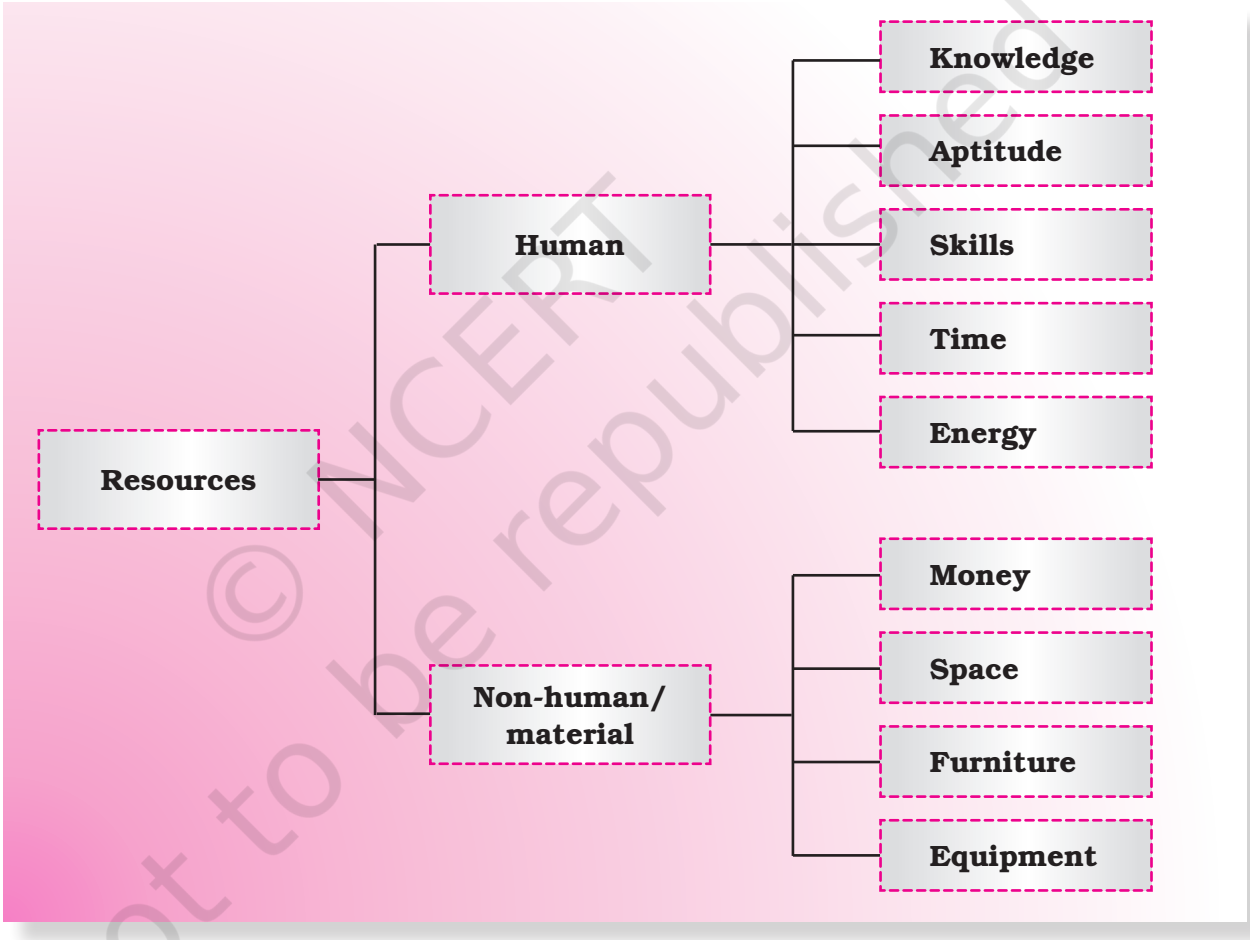
to other resources. In the previous chapter, you have learnt about your own strengths. These are your resources.

Anything which is not used by us is not a resource. For example, a bicycle which has not been used for long and is just lying at your place may not be a resource for you. However, it may be a resource to someone else.

If you re-look at the list of resources above, you will find that resources can be classified as–

- Human resources
- Non Resources-human resources or material goods



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Resources

Resources can be classified in different ways.

- Human/non-human resources
- Individual/shared resources
- Natural/community resources

We will read about each of these classifications.

Human and Non-human Resources

Human Resources

Human resources are central to carrying out any activity. These resources can be developed through training and self-development. For example, knowledge regarding any field/task can be acquired, skill may developed which will help you to develop aptitude. Let us read about human resources in detail.

(a) *Knowledge* – It is a resource one uses throughout one's life and is a pre-requisite for carrying out any activity successfully. A cook must have knowledge of how to operate cooking gas or *chullah* before she/he starts preparing food. A teacher who does not have thorough knowledge of her/his subject, cannot become an effective teacher. One needs to be open to acquiring knowledge throughout one's life.

(b) *Motivation/Interest:* There is a common saying, 'Where there is a will there is a way'. This indicates that to accomplish any task, the worker must be motivated and interested in doing it. For example, if a student is not interested in learning a task, even when other resources are available, she/he still may give excuses and not finish the task. We may pursue dance, painting, reading fiction, art and craft and other hobbies as per our motivation.

(c) *Skills/Strength/Aptitude:* All individuals may not be skilled in performing all activities. Each one of us has an aptitude in certain areas. We can therefore carry out activities in these areas better as compared to others. For example, pickles and chutney prepared by different individuals will taste different depending upon their skill. However, we can acquire skills we do not have through learning and training.

(d) *Time:* It is a resource available to everyone equally. There are 24 hours in a day and every one spends it in her/his own way. Time once lost cannot be regained. Hence, it is the most valuable resource. Managing time in a specific period and attaining the goal is very important. We need to continuously plan and be able to utilise the available time to finish the desired task.

Time can be thought of in terms of three dimensions — work time, non-work time, rest and leisure time. We need to learn and balance time across these three dimensions in order to be able to accomplish one's goals. When one learns to balance all the three dimensions, it helps the individual to be physically fit, emotionally strong and intellectually alert. You should be aware of the peak periods when you are best able to work and use this precious resource effectively to accomplish your goals.

(e) *Energy:* For sustaining individual growth and physical output, energy is essential. Energy levels vary from person to person, according to their physical fitness, mental condition, personality, age, family background

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and their standard of living. To conserve energy and to use it most effectively, one must carefully think and plan through the activity so that one can complete the task efficiently.

Non-human Resources

(a) *Money*: We all require this resource but it is not equally distributed among us – some have less of this resource as compared to others. We need to remember that money is a limited resource and must be spent judiciously to fulfil our requirements.

(b) *Material Resources:* Space, furniture, clothes, stationery, food items, etc., are some of the material resources. We require these resources to carry out activities.

Individual and Shared Resources

(a) **Individual Resources:** These are resources which are available to an individual for personal use only. These can be human or non-human resources. Your own skills, knowledge, time, your school bag, your clothes are some of the examples of individual resources.

(b) **Shared resources:** These are resources which are available to many members of the community/society. Shared resources can be natural or community based.

Natural and Community Resources

(a) **Natural Resources:** Resources available in nature, like water, mountains, air, etc., are natural resources. These are available to all of us. In order to protect our environment, each one of us has the responsibility of judiciously using these resources.

(b) **Community Resources:** These resources are available to an individual as a member of community/society. These are generally provided by government. These may be human or non-human. Consultancy provided by government hospitals, doctors, roads, parks and post offices are some examples of community resources. Every individual must strive to optimally use these resources and feel responsible in maintaining them.

Characteristics of Resources

Though we can categorise resources in various ways, they also have certain similarities. The following are some characteristics of resources.

(i) **Utility** : 'Utility' means the importance or usefulness of a resource in helping one to achieve a goal. Whether or not a resource has utility

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Activity 1

Think of your own self and make a list of the human resources you have. Use the following guidelines to reflect on this.

- Knowledge – which areas are you knowledgeable about
- Motivation/interest – what activities do you enjoy doing most
- Skills/strengths/aptitude – what are you particularly good at doing
- Time – which periods of the day are you most active
- Energy – Do you largely feel energetic or tasteless/tired?

depends on the goal and the situation. For example, cow dung is considered waste. However, it can be used as a fuel and can also be used to prepare humus (manure). Proper use of important resources available to a family or community leads to greater satisfaction.

(ii) **Accessibility** : First, certain resources are more easily available as compared to others. Second, resources may be more easily available to some people as compared to others. Third, the availability of resources changes over time. Thus, we can say that accessibility of resources varies from person to person and from time to time. For example, every family has money as a resource. While some have sufficient money to meet their needs, others have limited budgets. The amount of available money is also different during the beginning of a month as compared to towards the end of the month.

(iii) **Interchangeability** : Almost all the resources have substitutes. If one resource is not available, it can be substituted by another. For example, if your school bus does not arrive on time to pick you up, you can go to school in your car, tractor, bullock cart or scooter. Thus, the same function can be performed by a number of resources.

(iv) **Manageable** : Resources can be managed. Since resources are limited, they should be managed properly and effectively for their optimum utilisation. Resources should be used in such a way that we attain maximum output with minimum input of resources. For example, we should avoid using two-three buckets of water to wash clothes if we can wash them using one bucket.

Managing Resources

It is important to note that none of the resources are unlimited. All resources are finite. We need to utilise resources effectively to achieve our goals faster and efficiently. Resources, therefore, should not be misused and wasted. Thus, to achieve our goals, effective management of resources is extremely essential.

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Managing resources is about getting the most from the resources which are available to us. For example, everybody has 24 hours in a day. While some plan their schedule everyday and utilise every hour to achieve their goals, others waste their time and are not able to do anything productive the entire day.

Management of resources involves implementing resource management procedures which include planning, organising, implementing, controlling and evaluation. We will read about these in detail in the following section.

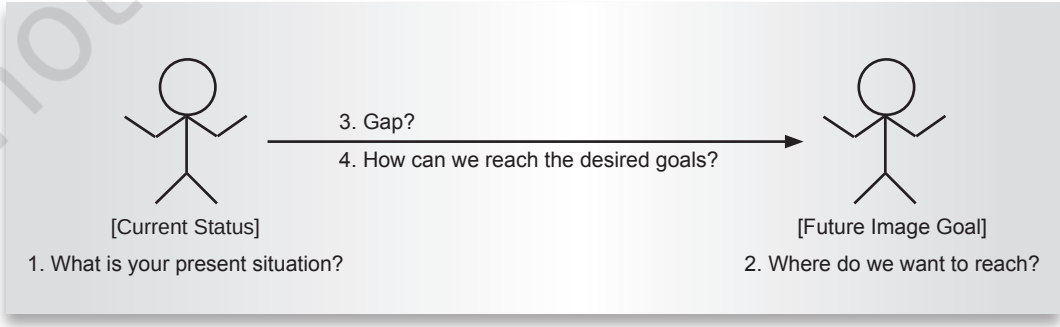
The Management Process

As stated above, the management process involves five aspects – planning, organising, implementing, controlling and evaluation.

(a) **Planning:** It is the first step in any management process. It helps us to visualise the path to reach our goals. In other words, to plan is to produce a scheme for action to achieve specified goals by using the available resources.

Planning involves selecting the course of action. To plan effectively to achieve a goal, you must ask the following four basic questions. The answers to these questions will help you to develop a plan.

1. What is our present situation? This involves assessing the present situation, analysing what one has at present and what one would like to have in future.
2. Where do we want to reach? This involves setting specific goals or targets which we desire to achieve keeping in mind the present and future needs.
3. Gap. This is the difference between our present situation and the desired situation. We need to cover this gap in order to achieve our goal.
4. How can we reach our desired goals? Answering this question will help you to decide how to cover this gap. This involves making a plan to achieve goals.



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- *Steps in planning : The basic steps in planning are–*
  1. Identifying the problem
  2. Identifying different alternatives
  3. Choosing between alternatives
  4. Acting to carry out the plan/Putting the plan into action
  5. Accepting the consequences

  For example, there is only one month left for your annual examination and you have not completed your revision (present situation); your aim is to score good marks (goal). To achieve this goal you need to study five subjects in the specified time period (gap). You would think of a way of achieving this goal (prepare a plan of action), which will include the number of hours you will devote to each subject, prioritising subjects, curtailing other activities and so on.

ACTIVITY 2

List the resources you would need in order to secure good marks and study well. Compare your list with others.

_____

_____

_____

_____

_____

(b) **Organising:** It is collecting and arranging appropriate resources in order to implement plans in an effective and efficient manner. If we take the above example, you would organise and arrange all the resources which you may require to study and secure good marks.

Some resources could include books, notes, space to study, light, stationery, energy and time.

(c) **Implementing:** This stage involves carrying out the prepared plan. In the above example, you would put the plan into action by starting to study from the available resources (e.g., books, stationary, notes, etc.).

(d) **Controlling:** It refers to the task of ensuring that your activities are producing the desired results. In other words, the plan you have put into action is getting the desired results. Controlling helps monitor the outcome of activities and makes sure that the plans are being implemented correctly. It is important as it provides feedback and helps to check errors. Feedback helps you to revise your plan of action so you can achieve your goal. Therefore, while you are putting your study

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plan into action, yet you are unable to complete your allotted chapter because you watch television, this gives you the feedback that you need to minimise your distractions. You will not watch T.V., play or chat with friends during the study hours, as it can affect the outcome of your formulated plan (i.e., study as per the decided number of study hours).

(e) **Evaluation:** In the final stage, the outcomes that you have arrived at after putting your plan into action are evaluated. The end result of the task is compared with the desired result. All the limitations and the strengths of the task are noted so that they can be used in future to achieve one's goals effectively. With reference to the example of studying, evaluation is what you do when you get back the checked answer sheets of the examination. You evaluate your marked answer sheets as per the preparation you had done for the examination and the results you had wanted to achieve. If the scores for any subject fall short of your expectations, you try to identify the reasons for the same. At the same time, you also try to find out your strengths which helped you to secure good marks in other subjects. Then you use these strengths to overcome your limitations to secure better marks in your next examination.

In addition to the different resources discussed in this chapter, there are some other non-human resources that form an integral part of our daily living. One such resource is fabrics. The following chapter tells us about the various fabrics that we come into contact with and their properties.

Key Terms

Resources, Human Resources, Non-human resources, Planning, Organising, Implementing, Controlling, Evaluation

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Activity 3

You wish to arrange a farewell party for Class XII students. Identify your resources and state the aspects you will keep in mind at each stage of the management process in organising the party.

Farewell Party for Class XII Students						
S.No.	**Resources Available**	**Planning**	**Organising**	**Implem-entation**	**Controlling**	**Evaluation**
1.	Human – Non-human	Venue? Menu?	Division of respon-sibility	(i) Decor-ating the venue? (ii) Keeping food ready?	Checking if the decor-ation is being done as per the plan?	Assess if the venue is looking good or not?
2.						
3.						
4.						
5.						
6.						
7.						

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Review Questions

1. Define a resource.
2. Classify resources in three different ways giving the definition of each resource and two examples of each.
3. Why should resources be managed?
4. Explain the steps in the management process, using one example to clarify each step.

PRACTICAL 4

Management of Resources – Time, Money, Energy and Space

(A) Record your day's activity from 6.00 a.m. onwards

Hours	Activity

(B) Only one week is left for the annual examination. Prepare a time plan indicating the number of study hours for each day. An example is given for Monday.

Day	**Hours**															
	7-8	8-9	9-10	10-11	11-12	12-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	9-10	10-11	11-onwards
Mon	Science Chapter 3		Maths Chapter 4, 5		Break	Revise Science	Lunch	Social Science Chapter 3		Sleep	English Chapter 5, 6		Hindi Chapter 4	Revise	Dinner	Sleep
Tue																
Wed																
Thu																
Fri																
Sat																
Sun																

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FABRICS AROUND US

5

LEARNING OBJECTIVES

After completing this chapter the learner will be able to —

- discuss the diversity in fabrics.
- name and classify the fabrics commonly seen around.
- explain the concept of yarn and fabric making.
- describe the properties of each group of fabrics.
- make informed selection of textile products for specific end use.

5.1 INTRODUCTION

Fabrics are all around us. They are an important part in our lives. Fabrics give comfort and warmth, bring colour and decorative style, and add texture. Just think of a day's activity and recall how fabrics touch you. When you wake up from your bed, the bedsheets and pillow covers are fabrics. As you get ready for school the towel you use after bath is a soft and absorbent fabric, and the school dress you wear is again a fabric of a special type. The school bag in which you carry your books and other items is also a fabric, but again different in texture. It may be slightly stiff and coarse but strong enough to bear the load. If you observe your home you will find fabrics in almost all places, from curtains to kitchen dusters, floor mops and *durries*. Fabrics are of different kinds, weights and thickness and their choice is related to their end use.

If you take a typical fabric in hand, and unravel it, you may be able to pull out the thread like structures from it. These may be interlaced with each other at right angles or interlooped as in your woollen cardigan or T shirts, or knotted as in nets and laces. These are called **yarns**. If you try to untwist the yarn you will see very tiny and fine hair like structures.

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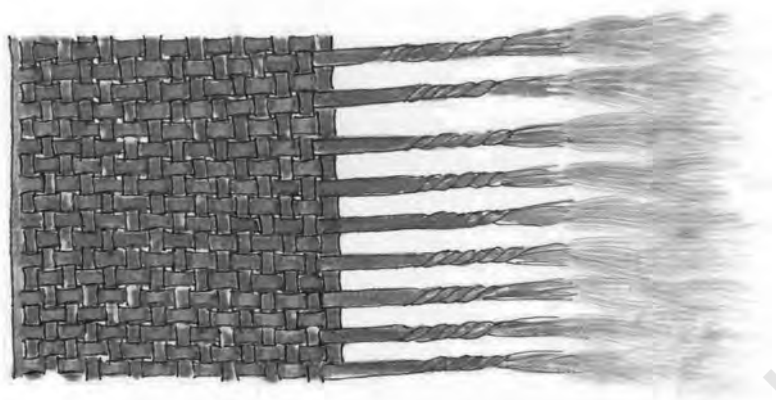

FIGURE1: FABRIC TO FIBRE

These are called **fibres**. Thus fibres are the basic building blocks of fabrics. All these materials — **fibres**, **yarns** and **fabrics** are called **textile products** or simply **textiles**. After the fabric is ready it may be subjected to further processing which may improve its appearance (cleaning, whitening, colouring) or make it more lustrous or improve its touch and feel qualities or improve its service ability. This is called **finishing**. A large variety of fabrics are available in the market these days and each one behaves differently when in use. The behaviour of the fabric in use and in care and maintenance depends on various factors such as type of fibre, yarn, fabric and finishing.

ACTIVITY 1

Collect different kinds of fabric samples from home, a tailor's shop, a cloth shop or friends. Name each fabric.

5.2 FIBRE PROPERTIES

The properties of fibre contribute to the properties of the final fabric. For a fibre to be really important and useful, it must be available in large quantities and be economical. The most essential property is its spinnability, i.e., a characteristic which is essential for ease of conversion into yarn and later into fabric. It is the sum together of properties such as length, strength, flexibility and surface structure of the fibre. From the point of view of consumer satisfaction, properties such as colour, luster, weight, moisture and dye absorption and elasticity are desired. Factors that affect care and maintenance of the fabric such as abrasion resistance, effect of chemicals, soaps and detergents, effect of heat, and resistance to biological organism are also important to the user.

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5.3 CLASSIFICATION OF TEXTILE FIBRES

Textile fibres can be classified on the basis of their origin (natural or man-made or manufactured), general chemical type (cellulosic, protein or synthetic), generic types (animal hair or animal secretion) and common trade name (polyester, as terene or dacron). Further, fibres can be **staple**, i.e., short length like cotton, or **filament**, i.e., long length like silk, polyester, etc.

Natural Fibres

Natural fibres are those which are available to us in nature. There are four types of natural fibres.

(a) Cellulosic fibres—
1. Seed hair-cotton, kapok
2. Bast fibres-flax(linen), hemp, jute
3. Leaf fibres-pineapple, agave(*sisal*)
4. Nut husk fibres-coir(coconut)

(b) Protein fibres
1. Animal hair–wool, specially hair (goat, camel), fur
2. Animal secretion–silk

(c) Mineral fibre: Asbestos

(d) Natural rubber

Manufactured Fibres (also called man-made fibres)

Most of you must have seen a cotton flower with fibres sticking to the seeds, or sheep with long overgrown hair. You can also imagine how these may be used for yarn and fabric production. However, you may find it difficult to understand how the manufactured or synthetic fibres came to exist.

The first manufactured fibre–Rayon–was commercially produced in AD 1895, while most others are products of the 20th century.

The concept of creating fibres perhaps originated from human desire to produce a fibre like silk. Possibly, the thought process could have been like this: the silk worm, which basically feeds on mulberry leaves, digests them and spews a liquid through its spinnerettes (two holes), which on solidifying becomes the silk filament (cocoon). Thus if a cellulose substance is digested it should be possible to produce something like silk. Therefore for a long time the rayons were referred to as Artificial Silk or simply Art Silk.

The earliest manufactured fibres were made by modifying a non-fibrous material into a fibrous form. These were mainly from cellulosic substances

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like cotton waste or wood pulp. The second group of fibres were synthesised completely from use of chemicals. Whatever may be the raw material the basic steps for converting it into a fibrous form are the same.

- The solid raw materials are converted into a liquid form of a specific viscosity. This may be due to a chemical action, dissolution, heat application or a combination action. This is called the spinning solution.
- This solution is passed through a spinnerette – a small thimble shaped nozzle with a series of very small holes, into an atmosphere which hardens it or coagulates it into fine filaments.
- As the filaments harden they are collected and stretched for further fineness and orientation or subjected to further processing like texurisation to improve its stretch and/or bulk characteristics.

FIGURE 2: SPINNERETTES

Types of Manufactured Fibres

(a) **Regenerated cellulosic fibres:** Rayon–cuprammonium, viscose, high-wet-modulus
(b) **Modified cellulosic:** Acetate–secondary acetate, triacetate
(c) **Protein fibres:** Azlon
(d) **Non-cellulosic(synthetic) fibres**
  (i) nylon
  (ii) polyester – terelene, terrene
  (iii) acrylic – Orlon, cashmilon
  (iv) modacrylic
  (v) spandex
  (vi) rubber
(e) **Mineral fibres**
  (i) Glass – fibreglass
  (ii) Metallic – lurex

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5.4 Yarns

The textiles in the form of fibres cannot always be used for consumer products except in products like surgical cotton, stuffing for pillows, quilts, mattresses and cushions. To convert fibres into fabric form as we see around us, they have to be converted into a continuous strand. Although there are some fabrics like felts or non-wovens which are made directly from fibres, in most cases the fibres are processed to an intermediate stage called yarn.

Yarn can be defined as a continuous strand of textile fibres, filaments or material in a form suitable for knitting, weaving or otherwise intertwining to form a textile fabric.

Yarn Processing

Yarn processing from natural staple fibres is called spinning, although spinning is the last stage in the processing.

Earlier young unmarried girls were commonly involved in spinning the finest yarn because of their nimble fingers. The term 'spinster' for unmarried women originated in that context.

Yarn processing, i.e., conversion of fibre into a yarn involves a number of stages.

Let us take them one by one.

(i) **Cleaning:** Natural fibres generally contain extraneous impurities depending upon their source, like seeds or leafy matter in cotton, twigs and suint in wool. These are removed, fibres sorted out and converted into **laps** (rolled sheets of loose fibres).

(ii) **Making into a sliver:** Laps are unrolled and subjected to straightening processes which are **carding** and **combing**. The process is similar to combing and brushing your hair. Carding disentangles the fibres and lays them straight and parallel to one another. For finer fabrics the laps are subjected to combing after carding. This process removes finer impurities and short fibres as well. The lap then passes through a funnel shaped device which helps to convert it into a sliver. **Sliver** is a rope like mass of loose fibres, 2-4 cms in diameter.

(iii) **Attenuating, drawing out and twisting:** Now that the fibres have been converted into a continuous strand, it needs to be made to the size required. This is called **attenuation**. Several slivers are combined for uniformity. The slivers are gradually drawn out so that they become longer and finer. If a blended yarn is required (e.g., cotswol-cotton and wool) slivers from different fibres are combined at this stage. The resultant sliver is still of the same size as the original sliver.

The **sliver** after drawing is taken to the roving machine where it is further attenuated till it becomes $\frac{1}{4} - \frac{1}{8}$ of its original diameter. It is given

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a slight twist to keep the fibres together. The next stage is spinning. Here the strand is given the final shape as the yarn. It is stretched to the required fineness and the desired amount of twist given to it and wound on cones.

FIGURE 3: COTTON SPINNING

All manufactured fibres are first made as filaments. The yarn can be composed of a single filament or a multifilament yarn when a number of individual filaments are taken together and twisted as one. It is also possible to cut the filament into staple length fibres. These are then subjected to spinning process as for natural fibres and are called spun yarns. Staple length fibres are also required when a mixed fabric/ blend like 'terecot' (terene and cotton) or 'terewool' (terene and wool) or 'polycot' (rayon and cotton) is required.

Yarn Terminology

(a) **Yarn number:** You may have seen certain numbers 20, 30, 40, etc., on the labels of thread reels. If you observe carefully and compare the fineness of the thread you will realise that thread reel with a higher number is finer. There is a fixed relationship between the weight of the fibre and the length of yarn drawn from it. This is designated as yarn number which becomes the indication of the fineness of the yarn.

(b) **Yarn twist:** As fibres are transformed into yarn, twist is added to hold the fibres together and is indicated as **t.p.i.** (twist per inch). Loosely twisted yarns are softer and more lustrous, whereas tightly twisted yarns may show as ridges such as in denim material of jeans.

(c) **Yarn and thread:** Yarn and thread are basically similar. Yarn is the term usually used in the manufacturing of a fabric, whereas, thread indicates a product used to join pieces of fabrics together.

5.5 FABRIC PRODUCTION

There are many types of fabric available in the market. Variation in different fabrics is due to the basic fibre content (cotton, wool, e.g.) or as you have just learnt, the type of yarn. When you look at the fabrics you may be able to distinguish between different structures as well.

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We will now discuss how these fabrics are produced. Most of the fabrics you see are made from yarns. However, a small group of fabrics can be made directly from fibres.

There are two main types of fabrics that are made directly from fibres–**felts** and **non-wovens** or **bonded fibre fabrics**. These fabrics are formed by laying the fibre (after carding and combing) in the form of a **matt** and then adhesion is caused between them. The matt can be made not only of required thickness but also of any shape.

Activity 2

Try and note the difference between the structure of the material of your shirt or dress, pant/jeans, towel, socks, shoe laces, floor covering felts *(namdas)* and carpets.

As already mentioned, the majority of fabric constructions require the intermediate yarn stage. The main methods of fabric construction are **weaving** and **knitting** and to a small extent **braiding** and **knotting**.

Weaving

Weaving is the oldest form of textile art, which was originally used for making mats and baskets. A woven fabric consists of two sets of yarns which are interlaced at right angles to each other, to form a compact construction. It is done on machines called looms. One set of yarns is fitted on the loom, which determines the length and width of the fabric to be woven. These are called **warp yarns**. The loom helps to maintain these yarns at a fixed tension and even space. The second yarn, which is the **filling yarn**, is then interlaced to form the fabric. The simplest interlacing is when the filling yarn moves over and under one warp yarn alternately in one row and reverses the process in the second row. By passing the filling yarn over and under different number of warp yarns, in a specified sequence, different designs can be created. Attachments like the dobby or jacquard to the loom can help to create figurative designs as well. These designs become clearer when different coloured yarns are used for warp and filling. Certain designs make use of an extra yarn which may run parallel to warp or filling yarns. This can be held up as loops during weaving, which may be left uncut or cut afterwards. This makes the texture like one sees in towels (uncut) or velvets and corduroy (cut).

The direction of the yarns in a woven fabric is referred to as **grain**. Warp yarns run along the length wise grain or **selvedge**. Filling yarns run along the width wise grain or **weft**. Thus the length and width in a woven fabric is called the selvedge and weft. When you buy a fabric, you see it has two cut sides and two bound sides. The bound sides are the selvedges. The fabric is strongest along the selvedge.

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Knitting

Knitting is the interlooping of atleast one set of yarns. It may be done by hand using a set of two needles for flat fabrics or a set of four needles for circular fabrics. Knitting may be done on machines. The process consists of making a series of loops along the knitting needle or machine bed. Each successive row is formed by interlooping with the first row of loops. The movement of the yarn is along the width of the material and therefore it is called **filling or weft knitting**. This method of knitting is used to produce articles which can be shaped while being constructed.

At the industrial level, the knitting machines used are like the looms for weaving. They have a set of yarns (like warp yarns) fitted on the machine. The interlooping occurs with adjacent yarns. This is known as **warp knitting**. This can produce continuous lengths of material, which unlike the weft knitted fabric can be cut and stitched.

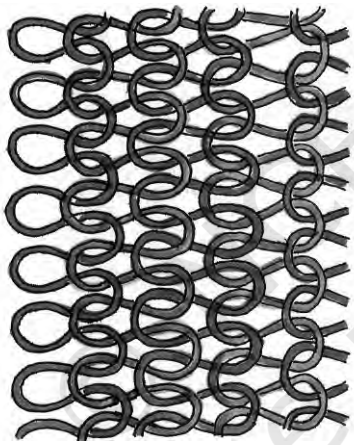

FIGURE 4: WEFT KNITTING

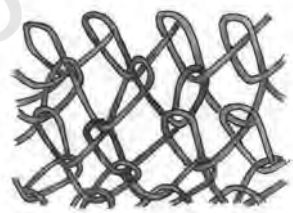

FIGURE 5 : WARP KNITTING

Knitted fabrics can be made more rapidly. Because of the system of loops they have more elasticity and thus are suitable for fitted articles like vests, underwear, socks, etc. They are porous and permit free circulation of air, are comfortable and allow freedom of movement and are therefore ideally suited for sportswear.

Braiding

Braided fabrics have a diagonal surface effect and are made by plaiting three or more yarns that originate from a single location and lie parallel before interlacing occurs. Braids appear in items as shoelaces, ropes, insulation for wires and trimmings.

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Nets

Nets are open mesh fabrics with large geometric interstices between the yarns. These are made by inter-knotting of yarns by hands or machines.

Laces

Lace is an openwork fabric consisting of a network of yarns formed into intricate designs. It is a product of a combination of procedures including yarn twisting, interloping and knotting.

5.6 Textile Finishing

If you see the fabric as it comes out from the loom you will not be able to recognise it as the material you see in the market. All of the fabrics that are available in the market have received one or more finishing treatments, and except for whites, colour has been added to them in some form or the other.

A **finish** is any treatment on the fabric which can change its appearance, its textures or its behaviour for specific use. Finishes that are considered absolutely necessary are known as 'routine'. The finishes may be durable (do not get removed on washing or drycleaning) like dyeing, or renewable (need to be applied repeatedly as they get removed on washing) like starching or blueing. A few important finishes depending upon their functions are:

Activity 3

Collect five labels of fabrics. Match the information with what you have just read.

- *Change appearance* : Cleaning (scouring, bleaching), straightening and smoothening (calendering and tentering)
- *Change textures:* Starching or sizing, special calendering
- *Change behaviour :* Wash and wear, permanent press, water repellent or water proof, mothproof, flame retardant or fire proof, antishrink (sanforisation).

(a) **Finishing with colour:** Colour is often the most important factor in selection of fabric, whether it is to be used for apparel or in the house. Substances that can add colour to the fabric in a manner that it does not easily wash out are known as **dyes**. The method of dying depends on the chemical natures of the fibre and the dye, and the type of effect desired. Colour application can be done:
- at fibre stage – for yarns of different colours or designed felts.
- at yarn stage – for woven checks, stripes or other woven patterns.

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- at fabric stage – the most common method for solid colour dye, as also for designed dying like *batik* and tie and dye and printing.

(b) **Printing**: It is a more advanced or specialised form of dyeing. It involves the localised application of colour which is restricted within the given limits of design. Printing uses special tools which cause the transfer of colour only to the specified areas. Thus, it allows the application of a number of different colours on the fabric. Printing can be done by hand tools like blocks, stencils or screens and at industrial level like roller printing or automatic screen printing.

5.7 SOME IMPORTANT FIBRES

Cotton

Cotton is the most widely used fibre for apparel and home textiles. India is the first country where cotton was grown and used, and it continues to be one of the largest cotton growing areas. Cotton fibres are obtained from the seed pod of the cotton plant. Each seed has a large number of hair attached to it. When the seeds ripen the pod bursts open. The seeds are separated from the fibres by a process called **ginning** and sent as large bundles (bales) for spinning.

Properties

- Cotton is a natural cellulosic, staple fibre. It is the shortest fibre with length varying from 1 cm to 5 cms, therefore the yarn or the fabric made is dull in appearance and slightly rough to touch. It is heavier in weight than most of the other fibres.
- Cotton has good moisture absorbency and it also dries easily. Thus it is comfortable for summer use.
- It is available in fabrics of all types of weights, fineness, structures and finishes. Muslin, cambric, poplin, long cloth (*latha*), casement, denim, sheeting material and furnishing material are some of the cotton fabrics available in the market.

Linen

Linen is a bast fibre, obtained from the stems of the flax plant. The term bast means the fleshy part inside the bark. To obtain the fibres the stems are steeped in water for a long time to rot away the soft parts, in a process called **retting**. After retting the woody parts are separated and the linen fibres are collected and sent for spinning.

Properties

- Linen is also a cellulosic fibre, therefore, many of its properties are similar to that of cotton.

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- The fibre is longer and finer than cotton, so the yarn produced is stronger and more lustrous.
- Like cotton, linen also absorbs moisture readily and, therefore, is comfortable. However, it does not absorb dyes very readily and therefore colours produced are not so bright.

Flax plant is cultivated in very few areas worldwide. Also it requires longer processing time, therefore, linen is used less than cotton.

Jute and Hemp are also bast fibres like Linen. They are coarser fibres and do not have good flexibility, and are therefore used for making ropes, gunny bags and other such products.

Wool

Wool is obtained from sheep hair. It can also be obtained from other animals like goats, rabbits and camels. These fibres are called speciality hair fibres. Different breed of sheep provide different types of hair. Some breeds are raised only for good quality of fibres they produce. Removal of hair from the animal is called shearing. It may be done once or twice a year depending on the climatic conditions. While shearing, effort is made to keep the hair in one piece which is called **fleece**. This makes the sorting of fibres easy because hair from different parts of the body vary in length and fineness. After sorting, the fibres are scoured to get rid of dirt, grease and dried perspiration. This is followed by carbonisation which removes entangled vegetable matter like leaves and twigs. Thereafter, the fibres are sent for spinning.

Properties

- Wool is a natural protein fibre. The fibres vary in length from 4 cms to 40 cms and may be coarse or fine depending on the breed of the sheep and the part of the animal body. It is characterised by a natural crimp or a built-in waviness responsible for elasticity and elongation properties.
- Compared to other fibres wool has low strength but has good resilience, and elastic recovery.
- Wool has surface scales which are water repellant in nature. However, it can absorb large amount of water but does not feel wet on the surface. This ability is responsible for its comfort in humid and cold atmospheres.

Wool is also used as blends with cotton, rayon and polyester, which improves its care and maintenance properties.

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Silk

Silk is a natural filament fibre produced by the secretion of silk worms. If silk is produced in controlled conditions (cultivated or mulberry silk), it is smooth, and longer fibres are produced which results in a smoother, finer and lustrous fabric. If silk is produced in wild or natural conditions, the resulting silk is coarser, stronger and short in length, which results in a thicker, coarser but stronger fabric (e.g., tussar silk). For production of good quality silk, silk worm cultivation is carefully controlled. It is called **sericulture**. Being a filament fibre silk does not require the spinning process but has to be reeled carefully from the cocoon. The yarns are made by twisting a number of filaments together. If the filaments break or when the insects break the cocoon, the broken filaments are processed through spinning like cotton, and this is called spun silk.

It is believed that silk was discovered accidentally when the cocoon of an insect fell in the cup of tea of a Chinese princess. She took it out and discovered that she could pull out a long continuous filament from the cocoon. The Chinese kept the art of producing silk a secret for over 2000 years—until about 500 A.D.

Properties

- Silk is a natural protein fibre and the natural colour of silk is off white to cream. Wild silk is brownish in colour. Silk filaments are very long, fine, smooth and have a relatively high lustre or sheen. It contains a natural gum which gives silk a crisp texture.
- Silk is one of the stronger fibres used in making fabrics. It has good elastic recovery and moderate elongation.

Rayon

This is a manufactured cellulosic fibre. Cellulosic because it is made from wood pulp and manufactured because this wood pulp is treated with chemicals and regenerated into fibres.

Properties

- As rayon is a manufactured fibre the size and shape can be controlled. It has uniform diameter and is clear and lustrous.
- Rayon being a cellulosic fibre has most properties like cotton. But it has a lower strength and durability.

The main advantage of rayon and manufactured cellulosic fibres is that they can be reprocessed out of waste material and have an appearance like silk.

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Nylon

Nylon was the first true synthetic fibre (totally manufactured from chemicals) to be manufactured. It was first introduced as bristles for tooth brushes. In 1940, the first fabrics from Nylon were socks and stocking which were very successful. Thereafter, it was used for all kinds of fabrics. It also provided the impetus for other synthetic fibres which followed.

Properties

- Nylon filaments are usually smooth and shiny, with uniform diameter.
- Nylon has very good strength and abrasion resistance. Its resistance to abrasion makes it appropriate to be used in brushes, carpets, etc.
- Nylon is a highly elastic fibre. Very fine and transparent fibres are used for 'one-size' garments like stockings.
- Nylon is a popular fabric used in apparel, socks, undergarments, swimsuits, gloves, nets, sarees, etc. It is a leading fibre in the manufacture of hosiery and lingerie. For outerwear it may be blended with other fibres.

Polyester

Polyester is another manufactured synthetic fibre. It is also referred to as Terylene or Terene.

Properties

- Polyester fibre has uniform diameter, smooth surface and rod like appearance. It can be made in any strength, length and diameter as per the requirements of the end use. The fibre is partially transparent and lustrous.
- The moisture regain of polyester is very low, i.e., it does not absorb water easily. Thus, it is not very comfortable to wear in hot dry summer months.
- The most advantageous property of polyster is its wrinkle resistance. It is one of the most commonly used fibre for blending with rayon, cotton and wool and, to some extent, spun silk.

Acrylic

This is another synthetic fibre. It resembles wool so much that even an expert may not be able to find the difference between the two. It is commonly called as Cashmilon. It is cheaper than wool.

Properties

Like all manufactured fibres the length, diameter and fineness of the fibre are controlled by the manufacturer. The fibre can be made in varied degrees of crimp and luster.

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- Acrylic is not very strong and its strength is similar to cotton. The fibres have high elongation with good elastic recovery.

Acrylic is used as a substitute for wool and is used in children's wear, apparels, blankets and knitted goods.

Elastomeric fibres

Apart from the fibres mentioned so far, there are a few less known ones. These are elastic, rubbers like substances and can be produced in various forms. In its natural form they include rubber and the synthetic equivalent is spandex or Lycra. These are usually used as blends with any of the above fibres with low elasticity.

Having studied about fabrics in this chapter, you will be introduced to the world of apparel, i.e., clothes, made from fabrics later under the section 'Childhood'.

Knowing about fabrics is important for the adolescent as it would enable one to make wise selection of clothes – an interest that is commonly shared by all adolescents. Apart from clothes, another interest that binds adolescents from different contexts is media and communication. Let us learn more about these two interrelated aspects in the next chapter on Media and Communication Technology.

Key Terms

Fabrics, Yarns, Fibres, Textiles, Textile finishing, Weaving, Knitting, Cotton, Linen, Wool, Silk, Rayon, Nylon, Polyster, Acrylic.

REVIEW QUESTIONS

1. Name five articles of everyday use that are made from different types of fabrics.
2. How are textile fibres classified? Briefly discuss their characteristics.
3. What is a yarn? Explain different methods of yarn processing?
4. List the processes in fabric production.
5. Mention any three properties of each of the following fibres.
   - Cotton
   - Linen
   - Wool
   - Silk
   - Rayon
   - Nylon
   - Acrylic

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Practical 5

Fabrics Around Us

Theme Fabrics around us
Task 1. Make a record of fabrics and apparels used in a day
2. Analyse the suitability of the fabrics to the product

Conduct of the practical: Identify a particular day and note the fabrics and apparel that you use and experience throughout the day. You can use the following table for recording in various categories – (for self and 'in surroundings' like the examples given in the table).
E.g.

Time of day	Use	Product	Fabric
6:00 am	Self	Towel	Cotton
6:00 am	Surrounding	Pillow cover	Cotton

Form groups of 4-5 students and pool your observations; and also discuss the fabrics used for apparel worn by them in school and at home.

Practical 6

Fabrics Around Us

Theme Thermal property and inflammability of fabrics
Task Burning test on various fabrics and analysis of its type

Purpose of the Activity: Inflammability of fabrics will help to test the behaviour of fabrics in flame and while approaching flame. This will help consumer in taking special care when in use. This is also a way of identifying fibre content of fabrics which are in five composition.

Heat affects different fibres in different ways. Some fibres scorch and flame, others melt and/or flame or shrink. Some fibres are self extinguishing, others are completely non-combustible.

Burning Characteristics of Fibres					
Fibre	**Approaching flame**	**In flame**	**Removed from flame**	**Odour**	**Ash or residue**
Cotton and Linen	Does not shrink, catches fire	Burns quickly	Continues burning, has an afterglow	Burning paper	Light, soft ash, retains shape

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Wool and silk	Curls away from flame	Burns slowly	Self extin-guishing	Burning hair	Brittle, curled, small amount, crushable ash
Rayon	Does not shrink, catches fire	Burns quickly	Continues to burn rapidly	Burning paper	Light, fluffy residue, very small amount
Nylon	Shrinks	Melts, catches fire	Continues melting	Acrid	Hard, tan coloured bead
Polyster	Shrinks	Melts, catches fire	Continues melting	Plastic burn-ing	Hard, black coloured bead
Acrylic	Does not shrink, catches fire	Burns rapidly with melting	Continues burning	Acrid	Hard, black coloured, crinkly bead

Conduct of the practical

1. Take a narrow strip of the fabric (½ cm X 5 cm)
2. Hold the strip with a forceps or tongs and do the burning test by bringing it near a burning candle, or low flame of spirit lamp.

Precaution

Perform this experiment on a very low flame of a candle or spirit lamp under the supervision of a teacher.

3. Repeat the process by taking 4-5 samples of different fabrics and record the observations.

	Appro-aching flame	In flame	Removed from flame	Odour	Residue (colour and texture)	Conclusion

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Media and Communication Technology

6

Learning Objectives

After completing this chapter the learner is able to —

- define the concept of communication.
- discuss the significance of communication in everyday life.
- enlist the different types of communication.
- describe the process of communication.
- explain the classification and functions of media.
- analyse the various communication technologies.

An important field of study that has an impact on adolescents is that of media and communication. In this chapter we will discuss how these two aspects of our everyday ecology have become an integral part of our lives, usually adding to the quality of our lives. We will begin with the concept of communication first.

6.1 Communication and Communication Technology

Communication is very basic and vital for human survival and has existed since the inception of life on earth. In modern times, with fast developing technologies, new communication methods and gadgets are introduced in the market almost every week. Some of these have become more popular due to their cost effectiveness and utility, and have sustained over time.

Observe the following pictures and interpret the situation, feelings and thoughts of the different persons.

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What is communication?

Communication is the process of thinking, observing, understanding, analysing, sharing, and transmitting or transferring feelings to others through a variety of mediums in diverse settings. It also refers to seeing or watching, listening or hearing, and exchanging ideas, thoughts, experiences, facts, knowledge, impressions, moments, emotions, and the like with self or with others.

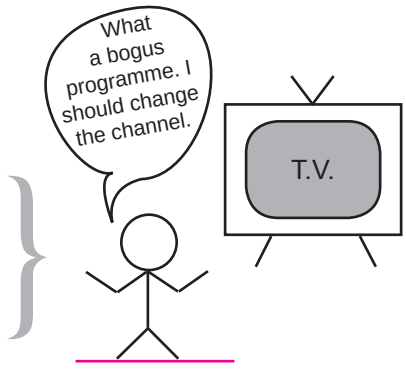
As the name suggests, the word **communication** stems from the Latin word **communis** meaning **common**. It is therefore, not only sharing of ideas, thoughts or imparting knowledge and information, but it also involves understanding the exact meaning of the content in a way that is common to both, the communicator and the receiver. Thus, effective communication is a conscious effort in creating a shared understanding about the intended meaning of the message among people involved in the communication. The process of communication is continuous and permeates all areas of social life, including home, school, community and beyond.

Classification of Communication

Communication can be classified on the basis of the following depending on the levels, types, forms and modes.

A. Classification based on the type of interaction

(i) *One-way communication:* In such situations the receiver receives information but is either never able to reciprocate to the sender or cannot respond immediately. Therefore, communication remains one–way. Speeches, lectures, sermons, listening to music on the radio or a music system, watching any entertainment programmes on television, using internet to search information on a website, etc., are examples of one-way communication.



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(ii) *Two-way communication:* This is comm-unication that takes place between two or more persons where all the parties communicating with each other share or exchange ideas, thoughts, information, etc., either

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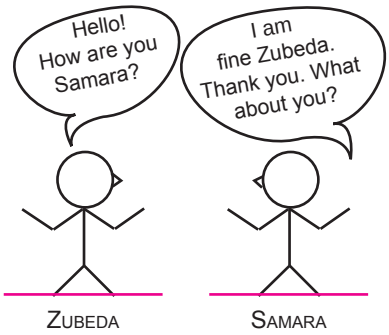


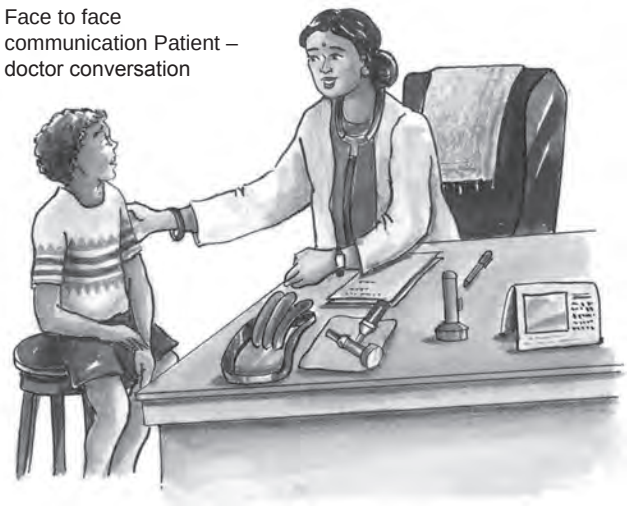
silently or verbally. Some of the examples could be talking on mobile phone, discussing about future plans with one's mother, using internet for chatting, etc.

When a baby cries to communicate her/his hunger, she/he is fed by the mother in response. The cry of the baby is the message that communicates the hunger of the child and is vital for the survival of the baby. Thus, in this case the communication is two-way.

B. Classification based on the levels of communication

(i) *Intra-personal communication:* This refers to communicating with oneself. This is a form of mental process involving observing, analysing, and drawing conclusions meaningful to the individual's present, past and future behaviour and life. It is an on-going process that transpires inside an individual. For instance, mental rehearsal before appearing in an interview or oral exam.

(ii) *Inter-personal communication:* It refers to sharing of thoughts and ideas with one or more people in a face-to-face situation. It can take place in a formal or an informal situation. Varied means of communication like body movements, facial expressions, gestures, postures, written text and verbal modes such as words and sounds



Face to face communication Patient – doctor conversation

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can be used for this type of communication. Examples are talking to your friend about difficulties faced while studying or conducting an experiment or participating in a panel discussion followed by question-answer session.

Inter-personal communication is the most effective and ideal type of communication for two reasons. First, there is always proximity and direct contact between the communicatee and the communicator, and therefore it is easy to persuade, motivate and convince the communicatee for acceptance of the introduced idea or thought. Second, instantaneous and strong feedback with direct response of communicatee on the introduced idea is possible.

(iii) *Group Communication:* This form of communication is direct and personal, such as inter-personal communication, but with the involvement of more than two persons in the communication process. Group communication helps to facilitate a participatory approach and collective decision-making, gives an opportunity for self-expression, and increases the individual's impact in a gathering, thereby augmenting one's status in the group. It also helps in recreation and relaxation, socialising and motivating. A range of audio-visual aids may be used to enhance group communication.

(iv) *Mass Communication:* As a result of considerable advancement in technology, making thoughts, ideas and innovations reach the larger section of society has become possible. Mass communication can be defined as the process of multiplying messages with the help of any mechanical device and disseminating the same to the masses. The means and media of mass communication are radio, TV, satellite communication, newspapers, and magazines. The audiences of mass communication are very large in size, heterogeneous and anonymous, spread over a large area and separated from the communicator in terms of time and space. For these reasons it is not possible to take a correct, complete, direct and immediate feedback; rather there is slow, cumulative, expensive, and delayed feedback.

(v) *Intra-organisational Communication:* Organisational communication takes place in highly structured settings. Just like human beings, when people work together in an organisation, organisations also establish and maintain relationships. They use various levels of communication within their environment and amongst their departments or sections. Every organisation has different levels or hierarchy of ranks working together for achieving common goals. The information flow in such organisations is expected to be two-way at the same level and one-way across levels.

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(vi) *Inter-organisational Communication:* This refers to the communication system developed by one organisation to communicate with other organisations with the aim of working in cooperation and coordination with each other. For example, for assistance in developmental activities of the country, both technical and financial support is provided by international agencies, whereas, administrative support is given by the Central government and State governments.

It is important to note that in both inter-organisational and inter-organisational set-ups, communication does not take place among the departments or organisations; rather it is always human beings working in these organisations who communicate with each other. Therefore, understanding of the human factor is very important.

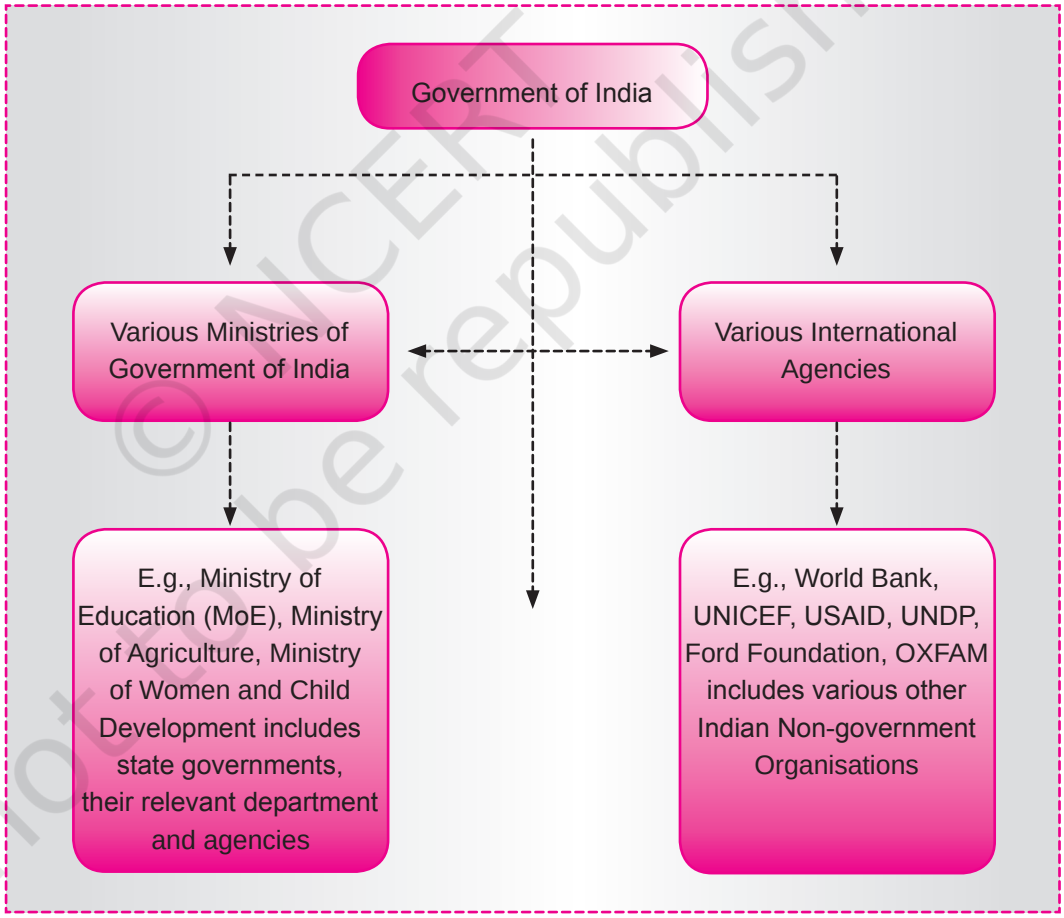

FIGURE 1: COMMUNICATION SYSTEM AMONG VARIOUS ORGANISATIONS

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C. Classification based on the means or modes of communication

(i) *Verbal communication:* Auditory means or verbal modes like speaking, singing and sometimes even the tone of voice, etc., are of significance in verbal communication.

Research shows that on an average, an individual spends about 70 per cent of her/his active time in communicating verbally, i.e., listening, speaking and reading aloud.

(ii) *Non-Verbal Communication:* Non-verbal means of communication are gestures, facial expressions, disposition, posture, eye contact, touch, para-language, writing, clothing, hair styles, and even architecture, symbols and sign language such as smoke signals used by some tribal people.

D. Classification based on the involvement of number of human senses

Have you ever tried to know why learning about our rich traditional heritage by simply watching folk or classical dance performance live or on television makes it easy to understand and more interesting than reading about them in a book?

Our senses and Communication		
• People retain 10% of what they	Read	visual
• People remember about 20 – 25% of what they	Hear	audio
• People keep in mind about 30 – 35% of what they	See	visual
• People remember 50% and more of what they have	Seen, Heard	audio-visual
• People remember 90% and more of what they have	Seen and Heard and Done	audio-visual
Involvement of more number of senses makes the learning more clearly understandable and permanent		

Table 1: Classification of communication based on number of senses involved

Type of communication	Examples
Audio	Radio, audio recordings, CD players, lectures, landline or mobile phones

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ACTIVITY 1

List the various means or modes, types and levels of communication involved in the following experience. Pen down your observations—Did you have the opportunity to live or visit a rural area or a village or a small town in the country? What was your experience? Did you observe symbols of advanced technology and communication like mobile phones, fax machines and other equipments, electricity poles and other similar things? How was the experience of meeting and interacting with people–young, women and older persons? Discuss this in your class.

Visual	Symbols, printed materials, charts, posters
Audio-Visual	Television, video films, multi-media, internet

How does communication take place?

The process of communication

Communication is the process of transferring **information or content** from a **sender** to a **receiver** with the use of a **medium**. It involves flexibility to exchange information using several methods in which the information is correctly, clearly and completely understood by both sender and receiver. It also takes the **feedback** of the audience on the message sent for further planning in the same way as carrying out market surveys before launching a product in the market.

Let us see the sequence in which the communication events occur. One way to describe it is as follows: **Who says, what, to whom, when, in what manner, under what circumstances and with what effect.** The basic elements of any communication process in general are arranged in a definite order to complete the cycle. Six elements have to be handled skillfully for effective and successful communication and can be easily understood by "**The SMCRE Model**" of communication.

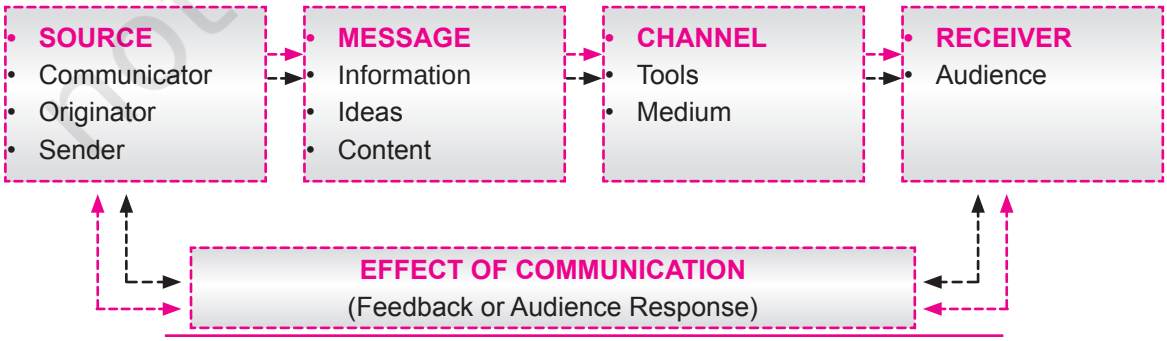

FIGURE 2: THE SMCRE MODEL OF COMMUNICATION

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The SMCRE model (Figure 2) shows the complete process of communication and the elements involved in it.

1. **Source:** It is the person who initiates the process of communication. She/he is the key factor responsible for the effectiveness of the whole communication process. She/he gives the message to a specific group of audience in such a manner that it not only results in correct interpretation of the message but also yields the desired response. She/he could be your teacher, parents, friend or classmate, extension worker, leader, administrator, writer, a farmer or a tribal person from a remote area of the country possessing indigenous knowledge.

Activity 2

Identify the possible sources of information in villages/rural areas.

2. **Message:** It is the content or information a communicator wishes to receive, accept or act upon. It could be any technical, scientific or simply generalised information or ideas, specific or general to any field of knowledge or day-to-day life of an individual, group or even a larger section. A good message should be simple yet appealing and clear. It should also be very specific, authentic, timely, appropriate and applicable for the channels selected and the nature and type of the receiver group.

Activity 3

Collect one news story or a campaign or a social message from any two media such as radio, print or TV.

3. **Channel:** The medium of communication through which the information flows from a sender to one or two receivers is a channel. Face-to-face, word-of-mouth is the simplest and one of the most effective means of communication. It is perhaps the most widely used medium of communication in a majority of developing and less-developed countries of the world. But with the passage of time and social change in society the emphasis has shifted to advanced mass media and multi media technologies.

Activity 4

Find out any one traditional method which tribal and/or rural people in the country use to make important announcements in their areas.

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There can be two types of channels:

(i) Inter - personal communication channels such as individuals and groups.

(ii) Mass media communication channels, e.g., satellite, wire-less and sound waves.

4. **Receiver:** It is the intended audience of the message or the target of the communication function. It could be an individual or group, men or women, rural or urban, old or young. The more homogeneous the receiver group, the greater are the chances of successful communication.

ACTIVITY 5

As a receiver of information write down the type and quality of information you tend to get from your school.

5. **Effect of communication (feedback):** A communication process is incomplete unless the response to the message is received. It is the initiating step as well as the terminating element in any communication process. Termination occurs when the response to the message is the same as expected. In such a situation, since the objective is achieved, the cycle is complete. However, if the response of the intended audience does not yield the desired results, rethinking and recasting of message occurs and the entire communication process is repeated. Here are a few examples: (a) When a teacher has taught a lesson, at the end she/he asks the students questions to find out if the lesson has been understood. The activity of asking questions and finding out what themes and parts were understood and which topics need to be explained again is a feedback. (b) Letters from readers in newspapers and magazines are a form of feedback to the editor and writers. (c) The ratings Television Rating Points (TRPs) of a television programme are another form of feedback from viewers.

6.2 WHAT IS MEDIA?

If you listen to the radio or watch television, perhaps you are aware that what you hear or see influences you in one way or the other. That is media influence. Let us see how the media influences us.

Identify the most common element in the following: Advertisements and programmes we see on television, films on TV or theatre, the news we read in the newspapers, the speech of a politician, instructions imparted by the teacher in the classroom, or a complaint that is registered when an appliance is not functioning well, or shopping through internet sitting at home.

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You will find that the common element in all these is that some or the other **medium** has been used to pass on or share varied messages or information across diverse fields. For instance, when we talk to someone or hear someone talking, it is the air that acts as a medium through which the sound waves travel since no sound can be transmitted in a vacuum.

Therefore, if communication is a process, **media is the means that uses various methods of communication for disseminating and sharing, ideas, thoughts, feelings, innovations experiences, etc.** Mass media essentially uses modern technology for communication but the presence of technology does not always denote that mass communication is taking place. Mass media is always meant for heterogeneous, anonymous and large audience groups.

Does media mean only radio, and TV? No, all types of satellite transmission, computer and wireless technology are also included in it. Media has gone through a lot of change and development. Now numerous modern technologies are available as media for communication purpose.

Media classification and functions

Media can be classified into two broad categories, traditional and modern media.

Traditional media: Till very recently most rural extension work was completely dependent on traditional media such as fairs and radio. The situation is no different even today. Inter-personal communication media largely remains the most used and effective medium of communication in rural and remote areas. Examples of other traditional folk media are puppetry, folk dances, folk theatre, oral literature, fairs and festivals, rituals and symbols, print media such as charts, posters, newspapers, magazines, and other local publications from ancient times. Various traditional folk media are being used as indigenous channels of communication. Some very popular examples are – traditional folk theatre or drama like *Jatra* (Bengal), *Ramleela* and *Nautanki* (Uttar Pradesh), *Bidesia* (Bihar), *Tamasha* (Maharashtra), *Yakshagana*, *Dashavatar* (Karnataka) or *Bhavai* (Gujarat). Likewise various oral literature-cum-musical forms basically include folk or tribal songs and dances such as *Baul* and *Bhatiali* (Bengal), *Sna* and *Dadaria* (Madhya Pradesh), *Duha* and *Garba* (Gujarat), *Chakri* (Kashmir), *Bhangra* and *Gidda* (Punjab), *Kajri*, *Chaiti* (U.P.) and *Allha* (U.P. and Bihar), *Powda* and *Lavni* (Maharashtra), *Bihu* (Assam) and *Mand*, *Panihari*, and songs sung by *Charans* and *Bhaatt* (Rajasthan). There are various drum

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festivals with very rhythmic drum beats followed by dance and songs of the North-eastern and other tribal communities of the country. Different types of puppetry forms have also been common media for communicating messages along with providing entertainment. Among the most common are the string puppets or '*Sutradharika*' mainly used in Rajasthan and Gujarat, and *Chhaya Putli* (shadow puppets) which are more common in the southern parts of the country. Besides, there are numerous festivals, fairs, social rituals and ceremonies, *yatras,* etc., for conveying messages, expressions, feelings and traditions of the diverse communities across the country.

With changing times it became apparent that traditional communication media were neither sufficient nor well-equipped to meet the diverse information needs of the modern audiences. Hence, new media technologies have been popularised.

Modern media: With the advent of modern technology the range of communication media has expanded tremendously. New communication technologies, such as the mobile phone, are emerging with exciting features that have improved the quality and capacity of broadcast. The handy size of equipments has made them convenient for use in rural as well as remote areas. It has also increased the reach of modern communication technology. The availability of and access to computers, particularly the internet facility, has ushered a completely new era of communication media. Radio, satellite television, modern print media, films projected though various type of projectors, audio cassette and compact disk technology, cable and wireless technology, mobile phone, video film and video conferencing are some examples of modern media.

ACTIVITY 6

Collect information on different folk media used in your state in both urban and rural areas. If there are tribal areas in your state, collect the folk media relevant there.

Functions of media: The previous chapters have made you aware that as an adolescent you are likely to be influenced by media. It has the following functions.

1. *Information*: It includes both, providing information and information exchange. These days information is power. Communication is facilitated through various media such as radio, television, magazines, newspapers.
2. *Persuasion/Motivation*: We are not always convinced about whatever idea or thought we come across. Suitable communication media can be used to persuade an audience to accept an idea. This needs a

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deeper understanding of audience psychology and their socio-cultural background.

3. *Entertainment*: Both, traditional and modern communication media provide a wide variety of entertainment options starting from folk media and oral tradition to Direct to Home (DTH) telecast. Even for educational purposes media is used in an entertaining form to make learning easy and interesting.
4. *Interpretation*: Use of communication media, particularly pictographic presentations, and facts and figures make many difficult and complicated concepts easy to understand. For example, it is easy to locate and understand a geographical area with the help of a cartographic map or model of a globe than merely reading about it in a textbook.
5. *Transmission of values*: Media is expected to foster development of a healthy society by the transmission of wholesome values. For example, use of puppetry and cartoon films for teaching values through the story format that are attractive options.
6. *Education or training*: New learning experiences with the help of appropriate communication media in local language, and focussing on local problems always enrich the teaching–learning experience. These include interactive instruction video and audio cassettes, and discs of basic printed teaching-learning material on various concepts.
7. *Coordination*: Due to the introduction of modern interactive communication technologies, distance and physical proximity has become less important. Pace, scope and accuracy of communication has expanded to such an extent that it has now become very easy to sit in one place and coordinate large projects spread over a vast geographical area.
8. *Behavioural change*: All extension education activities related to varied fields, be it health, literacy, environmental issues, empowerment programmes and adoption of innovations depend largely on the art and technique of effective communication. Media remains the main vehicle for the transmission of useful messages, acceptance of which leads to direct and indirect behavioural change in the target people.
9. *Development:* Media is a catalyst (medium) in national development. Communication mediates between specialists and lay persons. Thus, communication occupies a pivotal position in the process of development. Media has accelerated the pace of development and made the world smaller by bringing people closer through communication.

Both communication and media employ modern technology for reaching out to people. We will read about this in the next section.

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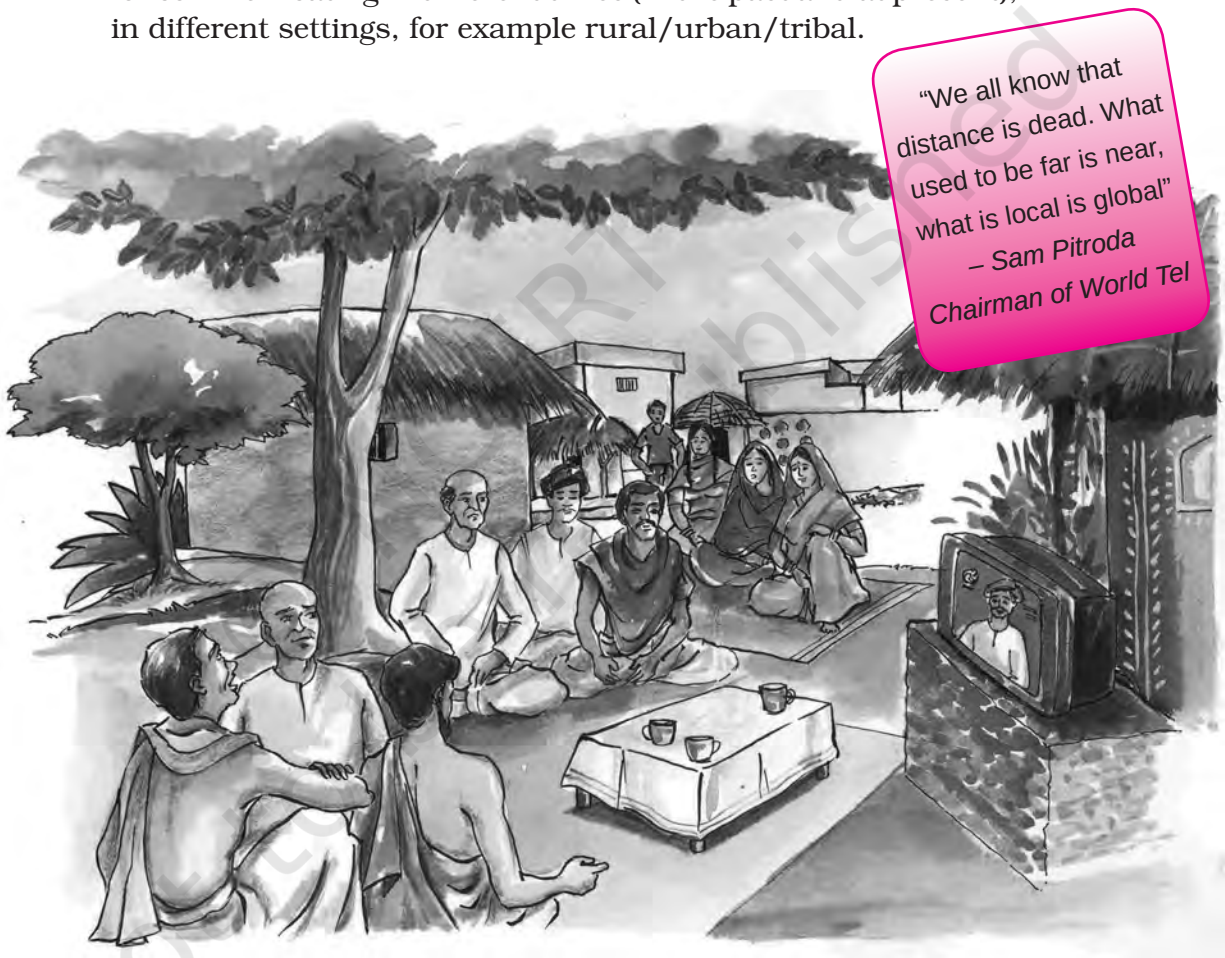
6.3 What is communication technology?

The global scenario is passing through a communication revolution and communication technologies are changing very fast. What is new today may be obsolete tomorrow. People want to know everything in a very short span of time. There is information overflow and it is easily available and accessible to all through a wide variety of traditional and modern mediums. It is here that communication technology is playing a key role.

We have been using different mediums and communication technologies for communicating in different times (in the past and at present), in different settings, for example rural/urban/tribal.



Let us have a look around us. You may have observed that many new technologies related to electronic media have revolutionised communication media?

Do you know that Pij village in Gujarat acquired the first TV transmitter in India, which provided programmes in local language along with common programmes from Delhi via satellite.

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Communication technology refers to **various technologies developed and used to handle information and aid communication**. This includes modern technologies that are used to transmit data, which could either be analogue (electronic signals) or digital. There are hardware, organisational structures, as well as social values which individuals access to collect, process, and exchange information.

Classification of communication technologies

A wide range of communication technologies are available. These fall into two broad groups.

(i) **Cable (land) based technologies:** These are comparatively cheap and less complicated. Landline telephone or a personal computer without internet are examples of such technology.

(ii) **Wireless technologies:** These generally require less infrastructure, but can be more expensive to use than cable-based technologies. Some examples are radio, microwave and satellite wireless telephony, or use of 'bluetooth' technology in mobile phones and computers.

Activity 7

Participate in a group discussion in your class on "Communication Technology – a curse or a boon?"

Two significant communication technologies that acted as media and changed the whole communication scenario are the radio and the television.

Radio: Radio commands a universal audience by geographical spread, income, education, age, sex and religion. Through on-the-spot broadcast or simulated broadcast it can overcome the barriers of time and space. With the use of small size transistors it was made possible to receive communication in the remotest parts of the country.

Television: TV was introduced in India in 1959 primarily to impact education and promote rural development. TV programmes are planned and produced using various techniques of visual magnification, sound amplification, super-imposition, split screen processes, fading, zooming, etc. These techniques make it more effective and strengthen the impact on the viewer.

Modern Communication Technologies

The list of modern communication technologies is long and every other day we hear of innovation in the existing technology. Following are some

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of the major types of modern communication technologies used primarily for extension purposes.

1. **Micro Computers:** Computers are classified as mainframes (large and costly), mini computers (less powerful) and micro-computers (based on microchip technology). This classification is based on their power, speed of executing a set of instructions and the amount of memory available to store data as well as degree of inter connectivity that the computer offers.

What is Bluetooth Technology?

Bluetooth Technology is a low-cost, short–range radio frequency (RF) link between mobile PCs, mobile phones and other portable devices capable of transmitting voice and data at the rate of 1 Mbps, which is from three to eight times the average speed of parallel and serial ports, respectively. It can transmit through solid, non-metal objects.

It allows wireless control of and communication between a cell phone and a hands free head set or a car kit.

The functions of micro-computer, particularly for extension work, include processing, keeping record of all kinds of information, performing accounting function, acting as repository of various cases, experiences to be used for research and field purpose in a very small space and publishing information material at reasonable cost. Computers can also communicate with each other if linked together and provide sourcing of information from across the globe.

2. **Video text:** Video text or view-data is an electronic text service transmitted from central computer to home TV–set via telephone network or cable system. It is interactive in the sense that the viewer has the option to access the desired data.
3. **Electronic mail (E-mail):** It is the system which passes information electronically from sender to receiver. E-mail system is like surface mail in which a message is typed on the computer and sent to another computer via the mobile phone. It is a simple way of communicating

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between two or more persons through the provision of a mail box. The message is stored in the computer which acts as a post office, unless the receiver asks for it. The mail can be viewed using a modem connected to the telephone.

4. **Interactive video:** Interactive video refers to a video system which is a combination of computer and video. It uses multi–media approach, i.e., text, still photographs, video, audio, slides, overheads, etc. The messages stored in different forms are received by the users as per their choice. The users' response to the system determines the path to be followed.
5. **Teleconferencing:** Teleconferencing is interactive group communication. It refers to a system meant for creating dialogue between geographically dispersed participants and physically distant people. Advances in telecommunication have made it possible to hold meetings without travelling to long distances.

Activity 8

Write any two messages that you remember from the hoardings displayed on road sides. Also write your interpretation of the messages:

- Message: _____
  Interpretation: _____
  _____
- Message: _____
  Interpretation: _____
  _____

Communication Technology thus greatly facilitates communication; more and more people across the world are using these technologies. Yet the human touch cannot be ignored. In our everyday lives we need to engage in face-to-face communication with different people. Every individual hence, needs to develop certain basic skills for effective communication. The next chapter on Effective Communication Skills, will help us understand this.

Key Terms

Communication, Group communication, Mass communication, Verbal and non-verbal communication, Media, Communication technology, Bluetooth technology, Satellite communication.

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Review Questions

1. What do you understand by the term communication? What are the various modes of verbal and non–verbal communication?
2. Explain the process of communication with the help of an example.
3. "The more the number of senses involved in the communication process, the more effective and sustainable is the communication". Write your comments with justification.
4. How does media affect our day-to-day life? Enumerate the different types of media.
5. How is the term communication technologies defined? Discuss two important communication technologies that have brought a revolution in the communication arena, giving justification for your answer.

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UNIT II

UNDERSTANDING FAMILY, COMMUNITY AND SOCIETY

The chapters in Unit I were all addressed to you for the understanding of self and of the factors that influence your decision making. Let us now move on to understanding the family, the community and the society that you are a part of. Chapter 7 will discuss concerns and needs, such as those of health, work, resources, education and textile tradition in the adolescent's diverse social contexts.

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Concerns and Needs in Diverse Contexts

A. Nutrition, Health and Hygiene

7

Learning Objectives

After completing this section the learner is able to—

- discuss the importance of health and its dimensions.
- understand the interrelationship of nutrition and health.
- identify the consequences of undernutrition and overnutrition.
- select appropriate and healthy food choices.
- identify the interrelationship between nutrition and disease.
- explain the importance of hygiene and sanitation for preventing food- borne diseases.

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7A.1 Introduction

Every person wants to live a good quality life and have a sense of well-being. As far back as 1948, the Universal Declaration of Human Rights stated: "Everyone has the right to a standard of living adequate for the health and well-being of oneself and one's family including food". Yet, many of the environmental conditions and our own lifestyles affect our health, sometimes having harmful effects. At the outset let us define "health". The world's premier organisation concerned with health, the World Health Organisation (WHO) defines health as "a state of complete mental, physical and social well-being and not merely the absence of disease". Disease means impairment of body health, alteration/disruption/derangement in function of some part or organ of the body, interrupting normal functions and deviating from a state of complete well-being. Health is a fundamental human right. All persons, irrespective of age, gender, caste, creed/religion, place of stay (urban, rural, tribal) and nationality, throughout their lives,

should have the opportunity to achieve and maintain the highest attainable state of health.

It is the aim of every health professional (persons who deal with various aspects of health) to promote good health; in other words, to promote maintenance of well-being or wellness, quality of life.

7A.2 Health and Its Dimensions

You must have noticed that the definition of health includes various dimensions–social, mental and physical. Let us briefly deal with all three dimensions before we discuss physical health in greater detail.

Social health: It refers to health of individuals and of a society. When we are concerned with society, it refers to a society in which there is equal opportunity and access for all citizens to the goods and services essential for good health. When we refer to individuals, we refer to each person's well-being – how well the individual gets along with other people and with social institutions. This includes our social skills and the ability to function as a member of the society. When we are faced with problems and stress, social support helps us to cope with them and solve the problems facing us. Social support measures contribute to positive adjustment in children and adults, and encourages personal growth. Emphasis on social health is gaining importance as scientific studies have shown that persons who are socially well adjusted, tend to live longer and recover faster from disease. A few social determinants of health are:

- Employment status
- Safety in workplaces
- Access to health services
- Cultural/religious beliefs, taboos and value systems
- Socio-economic and environmental conditions

Mental health: This refers to emotional and psychological well-being. An individual who experiences a sense of well-being can utilise his/her cognitive and emotional capabilities, function well in society and meet the ordinary demands of daily life. The box below lists the indicators of mental health.

A person who has positive mental health–

- feels that he/she is capable and competent.
- can handle normal levels of stress he/she faces in daily life.
- has satisfying relationships.
- can lead an independent life.
- if faced with any mental or emotional stress or events, he/she can cope with them and recover from them.
- does not fear things.
- does not feel defeated or depressed for unusually long periods of time when small difficulties/problems are encountered.

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Physical health: This aspect of health encompasses physical fitness and functioning of the body. A physically healthy person is able to undertake normal activities, does not feel unusually fatigued and has adequate resistance to infection and disease.

7A.3 Health Care

Every individual is responsible for his/her own health, but it is also a major public concern. Thus the government assumes considerable responsibility and provides health services at various levels to the citizens of the country. This is because good health is the foundation for good quality of life and standard of living for the individual and the family, and is the key for ensuring social, economic and human development of a community and a nation.

Health care consists of all the various services provided to individuals or communities by agents of health services or professions for the purpose of promoting, maintaining, monitoring or restoring health. Thus health care includes preventive, promotive and therapeutic care. Health Care services are delivered at three levels – primary care, secondary care and tertiary care levels.

Primary Health Care: The first level of contact between individuals with the health care system is known as Primary Health Care.

Secondary Health Care: When patients from primary health care are referred to specialised hospital also like district hospitals, it is called as Secondary Health Care.

Tertiary Health Care: When patients are referred from primary and secondary health system for specialised intensive care, advanced diagnostic support serious and medical care, then it is called as Tertiary Health Care.

7A.4 Indicators of Health

Health is multidimensional, with each dimension being influenced by several factors. Therefore, several indicators are employed to assess health. These include indicators of mortality, morbidity (illness/disease), disability rates, nutritional status, health care delivery, utilisation, environment, health policy, quality of life, etc.

7A.5 Nutrition and Health

Nutrition and health are intimately interlinked. In the global campaign of 'Health for All', promotion of nutrition is one of the primary elements. Nutrition is concerned with maintenance of body organs and tissues in structure and function. It is also concerned with growth and development of the body. Good nutrition enables the person to enjoy good health, resist infection, have adequate energy levels and perform daily tasks without

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feeling fatigued. In case of children and adolescents, nutrition is vital for their growth, mental development and achieving their potential. For adults, adequate nutrition is crucial to lead a socially and economically productive and healthy life. In turn, the health status of an individual determines the nutrient requirements of a person and food intake. During illness, nutrient requirements increase, and breakdown of nutrients are higher. Therefore, illness and disease adversely affect nutritional status. Hence, nutrition is a 'fundamental pillar' of human life, health and development.

7A.6 Nutrients

There are more than 50 nutrients in food. Nutrients are broadly classified into macronutrients (required in relatively larger amounts) and micronutrients (required in small quantities) based on the amounts required by the human body. Macronutrients are generally fat, protein, carbohydrate and fibre. Micronutrients include the minerals such as iron, zinc, selenium and the various fat-soluble and water-soluble vitamins, each of which performs important functions. Some of them function as co-factors and co-enzymes in the various metabolic reactions that occur in the body. Nutrients can also influence gene expression and transcription. Different organs and systems play a critical role in the digestion, absorption, metabolism, storage and excretion of nutrients and their end products of metabolism. In essence, each and every cell in all parts of the body requires nutrients. Nutrient requirements in the normal healthy state vary according to age, sex and the physiological state, i.e., during periods of growth such as infancy, childhood, adolescence, and pregnancy and lactation in women. Level of physical activity also determines requirements for energy and nutrients involved in energy metabolism, e.g., vitamins like thiamine and riboflavin.

Knowledge about nutrients, their metabolism and sources as well as functions are vital. One should consume a balanced diet which includes foods that will provide all the necessary nutrients in required amounts.

Balanced meal

The science of nutrition is concerned with access to, availability and utilisation of food and nutrients for life, growth, development and well-being. Nutritionists (professionals who work in this field) are concerned with myriad aspects. These range from biological and metabolic aspects to what happens in disease states and how the body

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is nourished (clinical nutrition). Nutrition as a discipline studies the nutritional needs of populations and their nutritional problems, including health problems caused by lack of nutrients (public health nutrition) and prevention of diseases such as heart disease, diabetes, cancer, hypertension.

We all know that when one is ill, one may not feel like eating. What and how much is eaten by a person not only depends on taste but availability of food (food security) which in turn is influenced by purchasing power (economic factors), environment (water and irrigation), and policies at the national and international levels. Culture, religion, social status, beliefs and taboos also influence our food choices, food intake, and nutritional status.

How do good health and nutrition help? Look around you. You will notice that people in good health are generally in a happier frame of mind and are more productive than others. Healthy parents are able to take adequate care of their children, and healthy children are generally happy and do well in school. Thus, when one is healthy, one is more constructive for oneself and can take active part in activities at the community level. It is therefore obvious that one cannot achieve good health and be productive, sociable and a contributory member of society if one is starving and undernourished.

Table 1: Optimum nutritional status is important because it—	
▪ maintains body weight	▪ provides resistance to infection
▪ maintains muscle mass	▪ helps to cope with physical and mental stress
▪ decreases risk of disability	▪ improves productivity

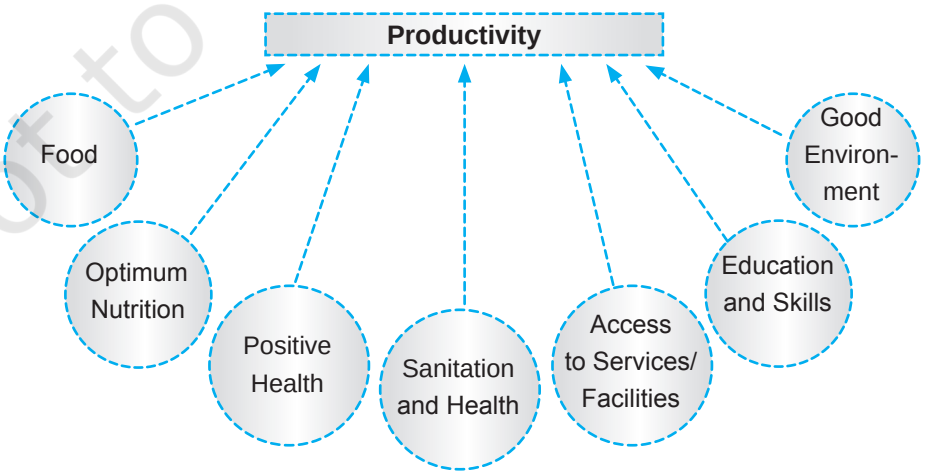

FIGURE 1: HEALTH AND NUTRITIONAL INPUTS REQUIRED FOR PRODUCTIVITY

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Figure 2 summarises the benefits of good nutritional status for children's education.

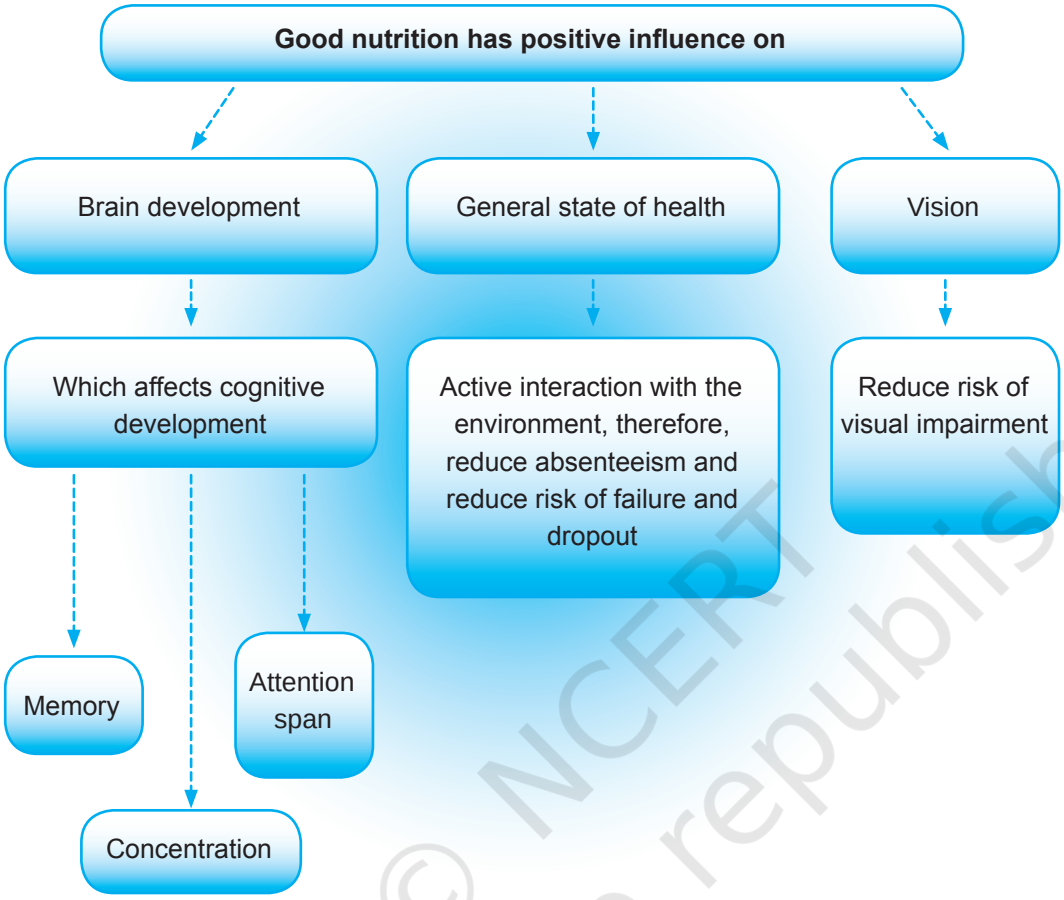

Figure 2: Benefits of Good Nutritional Status for Children's Education

What is malnutrition? Malnutrition is a deviation from the normal state of nutrition. When the intake of nutrients is less than the amount that is required by the body, or in excess of the requirements, malnutrition results. Malnutrition can take the form of overnutrition or undernutrition. Excess intake of nutrients results in overnutrition; inadequate intake results in undernutrition. Wrong food choices and combinations can be a very significant cause of malnutrition in adolescents.

7A.7 Factors Affecting Nutritional Well-being

The World Health Organisation has listed four main factors (as shown in the diagram) that are important for nutritional well-being.

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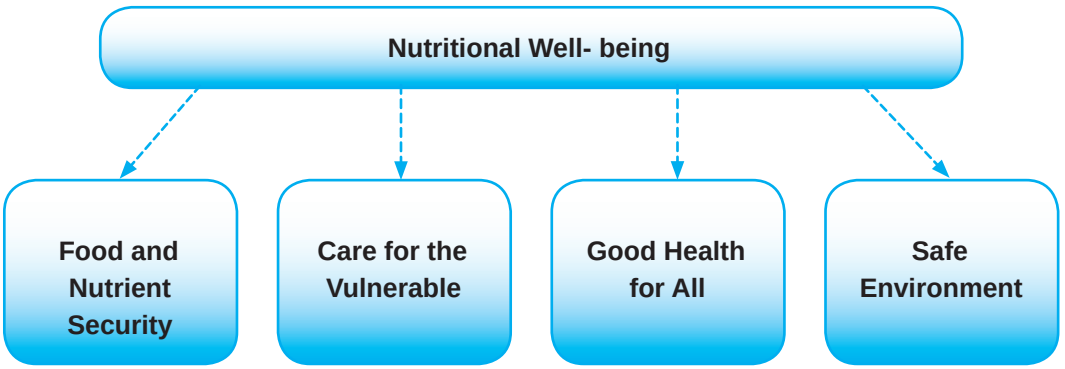

Food and nutrient security means that each and every person (regardless of age) has access to and can obtain adequate food and nutrients throughout the year, as per his/her requirements to enable him/her to lead a healthy life.

Care for those who are vulnerable means that each individual needs loving care and attention reflected by caring behaviour. In the case of babies it means whether the baby receives the correct type and amount of food as well as care and attention. In case of expectant mothers, it refers to whether they get all the care and support they need from the family, the community and in case of working mothers, from employers. Similarly, persons who are ill and suffer from any disease require care and support in various ways including food, nourishment, medication, etc.

Health for all includes prevention of disease and curing disease when it occurs. Special attention needs to be paid to infectious diseases since they can deplete the body of nutrients and lead to poor health and poor nutritional status. Every citizen should get a minimum amount of health care. Health is a basic human right. Some of the diseases that take their toll in India, especially among young children are diarrhoea, respiratory infections, measles, malaria, tuberculosis among others.

Safe environment focusses on all aspects of environment including physical, biological and chemical substances which may influence health. This includes safe, potable drinking water, hygienic food, and prevention of environmental pollution and degradation.

7A.8 NUTRITIONAL PROBLEMS AND THEIR CONSEQUENCES

In India, there exist several nutritional problems in the population. Undernutrition is a major problem which is reflected in the high numbers of pregnant women who are undernourished and have small babies with low birth weight as well as young children (below 3 years of age) who are

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underweight and stunted. One-third of the babies born in India are low birth weight, i.e., less than 2500 gms. Similarly, considerable percentage of women too are underweight. There are other nutrition-related deficiencies such as iron deficiency anaemia, vitamin A deficiency and consequent blindness and iodine deficiency. Undernutrition has several negative effects on the individual.

Undernutrition not only reduces body weight but has devastating effects on children's cognitive development, immunity and can also result in disability, e.g., blindness due to vitamin A deficiency. Iodine deficiency is a threat to health and development, specially for young children and pregnant women since it results in goitre, still birth, and miscarriage in women, and deaf-mutism, mental retardation and cretinism in children.

Iron deficiency also has negative impact on health and well-being. In infants and young children, its deficiency impairs psychomotor and cognitive development, and thus adversely affects scholastic performance. It also decreases physical activity. Iron deficiency during pregnancy affects the growth of the foetus and increases risk of morbidity and mortality for the mother.

Conversely, overnutrition is also not good. Intake in excess of requirements leads to several health problems. In case of some nutrients if may lead to toxicity, and the person may become overweight and even obese. Obesity in turn increases the risk of several diseases such as diabetes, heart disease and hypertension. In India, we face problems at both ends of the spectrum, i.e., undernutrition (nutritional deficiencies) and overnutrition (diet-related chronic, non-communicable diseases). This has been termed "double burden of malnutrition". In our country, the fourth National Family Health Survey (NFHS-4) shows that 26.6 per cent men and 31.3 per cent women from urban areas are overweight or obese, the percentage being much lower among rural men (15.0 per cent) and women (14.3 per cent).

Nutrition and infection: Providing enough food to fulfil nutritional requirements is not adequate. The influence of environment is also important. Nutritional status does not depend only on sufficient supply of food and nutrients but also on the person's health status, to a great extent. Nutrition and infection are intimately interlinked. Poor nutritional status decreases resistance and immunity, and thus increases risk of infection. On the other hand, during infection, the body loses considerable amount of its nutrient reserves (through vomiting and diarrhoea), while the nutrient requirements are actually increased. If nutrient intake is insufficient compared to the requirement due to loss of appetite or inability to eat (if there is nausea and/or vomiting), infections will affect the nutritional status adversely. Thus the risk of another infection increases, and all persons, especially children, the elderly and those undernourished are at the risk of contracting more infections/diseases.

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In developing countries, food-borne illnesses such as diarrhoea and dysentery are major problems since they can lead to dehydration and death. Many of the infectious and communicable diseases are due to poor environmental sanitation, poor household, personal and food hygiene. The key therefore is to look into how these diseases can be prevented.

7A.9 HYGIENE AND SANITATION

Prevention and control of disease has to address both intrinsic and extrinsic factors which are linked with various diseases. The box below lists these factors.

Table 2: Intrinsic and Extrinsic factors linked with various diseases

Intrinsic/host factors	Extrinsic/environmental factors
Age, sex, ethnicity, race	Physical environment – air, water, soil, housing, climate, geography, heat, light, noise, radiation
Biological factors such as heredity, blood groups, enzymes, levels of various substances in blood, e.g., cholesterol Functioning of various organs and systems	Biological environment includes the human being, all other living beings such as animals, rodents, insects, plants, viruses, micro organisms Some of these act as disease-producing agents, some as reservoirs of infection, intermediate hosts and vectors of disease
Social and economic characteristics, e.g., occupation, marital status, housing	Psychosocial factors-emotional well-being, cultural values, customs, habits, beliefs, attitudes, religion, lifestyle, health services, etc.
Lifestyle factors, e.g., nutrition, diet, physical activity, living habits, use of addictive substances such as drugs, alcohol, etc.	

Among these factors sanitation and hygiene, nutrition and immunisation are key inputs. When we speak of hygiene we are concerned with essentially two aspects: personal and environmental. Health depends to a great extent on the social environment as well as on lifestyle and behaviour, including food intake. It is also closely related to hygiene. Poor hygiene leads to several infections and infestations such as worm infestations.

Environmental hygiene comprises external matter, both organic and inorganic, at the domestic hygiene (home) and community levels. This includes **physical** factors such as water, air, housing, radiation, etc., as well as **biological** factors such as plants, bacteria, viruses, insects, rodents and animals.

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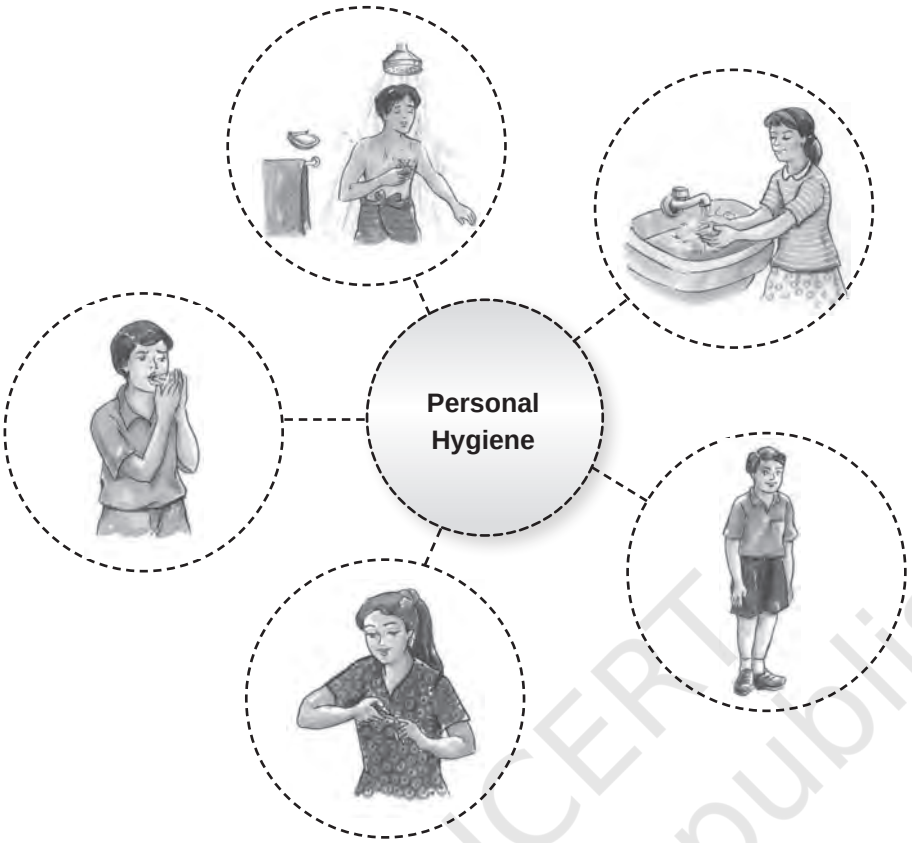

Figure 3: Personal Aspects of Hygiene

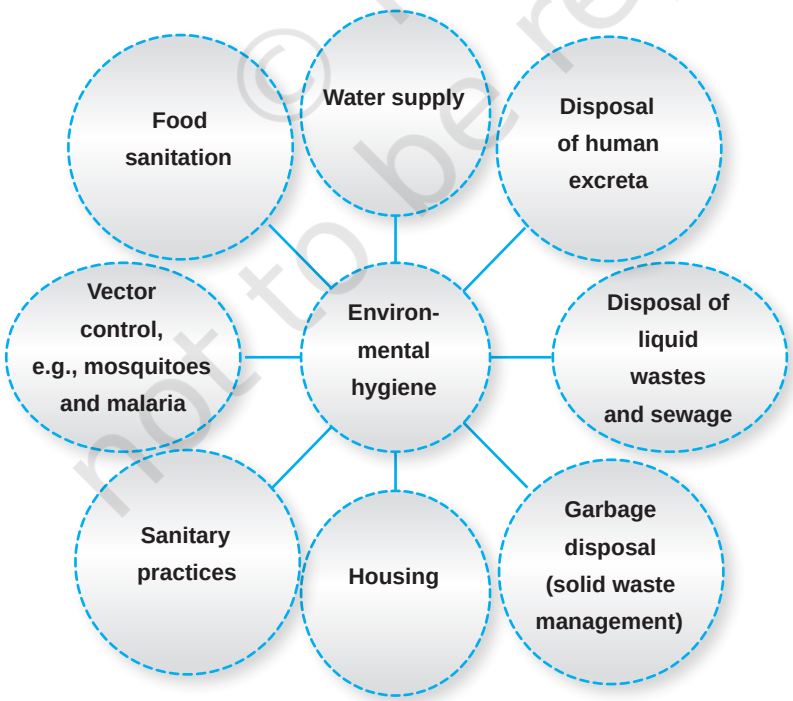

Figure 4: Environmental Aspects of Hygiene

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Environmental health needs attention so as to create and maintain ecological conditions that will promote health and prevent disease. Among these, safe drinking water and sanitation, especially feaces disposal, are of great importance. Similarly air and water pollution are of concern. Water quality is important as contaminated water is the cause for many diseases such as diarrhoea, worm infestations, skin and eye infections, guinea worm, etc.

Food Hygiene: Food-borne illnesses occur when we consume food that contains disease-causing (pathogenic) micro-organisms. Several factors are needed for a food-borne illness to occur.

- Either the organism or the toxin must be present in the food eaten.
- The number of pathogenic micro-organisms must be in sufficient numbers.
- The contaminated food must have been consumed in sufficient quantity.

The illnesses that are caused include diarrhoea, dysentery, amoebiasis, infective hepatitis, typhoid, listeriosis, botulism, cholera, gastroenteritis. Most of these are traced back to poor personal and food handling practices as outlined below.

- Use of food items that are spoiled/infected/unsafe, include water, spices, seasonings, mixes.
- Improper storage leading to multiplication of disease causing micro-organisms.
- Not practising insect and vermin control.
- Use of contaminated equipment, utensils and plates, spoons, glasses
- Inadequate cooking.
- Storage of foods at temperatures favourable to growth of microorganisms (4 to 600C).
- Improper cooling.
- Improper/inadequate heating/reheating of cooked foods/left overs.
- Cross contamination.
- Leaving food uncovered.
- Use of contaminated substances for garnishing.
- Poor hygiene and sanitation of persons handling food, such as unclean clothes, not washing of hands, dirt and grime under the nails.

Effective practices related to nutrition, health and hygiene are essential to be productive in the work that one does, within home or outside the home. The next chapter discusses the relationship between work, worker and workplace.

Key Terms

Health care, Nutrients, Malnutrition, Hygiene and sanitation, Food hygiene.

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Exercises

1. **Look up the following websites and discuss them in the class**
   - UNICEF's report on State of the World's Children
     http://www.unicef.org/sowc08/
   - Human Development Index
     http://hdr.undp.org/en/statistics/
   - WHO's World Health Report
     http://www.who.int/whr/en/

2. Identify at least 5-6 key indicators that you think are important for health and see how India ranks among the various countries in the world.
   Or
   Alternative for rural students: Interview two mothers of young children in your village. Ask each mother how many episodes of diarrhoea have occurred in the case of her child in the last one year. Give your comments on the reasons given by the mothers.
3. There are so many dimensions of health. List the various occupations or professions which are involved in providing services for health and nutrition – including prevention of health problems, promotion of good health and therapeutic services.

Review Questions

1. "Nutrition affects productivity, income and quality of life". Write your opinion about this statement.
2. How is nutrition linked to mental and visual disability and quality of life?
3. Divide the class into groups. Each group should visit a food service establishment, e.g., canteen/cafeteria, restaurant, street food vendor. Identify the poor hygiene practices related to (a) food hygiene (b) personal hygiene.
4. Have a class discussion on how hygiene can be improved and food can be rendered safer.
   Or
   Divide yourselves into three groups. One group will study the 'Food' aspect, the second will study 'People' and the third will assess 'Unit, facilities and equipment'. After listing the various aspects/parts/activities that increase risk of illness, the groups can be asked to give a presentation followed by a discussion on remedial measures.

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Note for Teachers

Teachers may guide students to organise an exhibition on Health, Nutrition and Hygiene for the school children, parents and members of community.

Note for students

In the vicinity of (a) your school (b) your home, observe and rate as very good, good, fair, poor and very poor at least three factors that are related to environmental hygiene.

■ PRACTICAL 10

A. Nutrition, Health and Hygiene

Compare the energy, protein, calcium and iron content of 150 g. edible portion of foods using the food composition tables provided—

(a) Cereals

Name of Cereal	Energy content (Kcal. per 150 g)	Protein content (g. per 150 g.)	Calcium content (mg per 150 g.)	Iron content (mg per 150 g.)
1. *Bajra*				
2. Rice (raw, milled)				
3. Maize (dry)				
4. Wheat (whole)				

(b) Pulses

Name of Pulse/ legume	Energy content (Kcal. per 150 g)	Protein content (g. per 150 g.)	Calcium content (mg per 150 g.)	Iron content (mg per 150 g.)
1. Bengal gram dal				
2. Black gram dal				
3. Lentil				
4. Soyabean				

(c) Vegetables

Name of Vegetable	Energy content (Kcal. per 150 g)	Protein content (g. per 150 g.)	Calcium content (mg per 150 g.)	Iron content (mg per 150 g.)
1. Spinach				
2. Brinjal				
3. Cauliflower				
4. Carrot				

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(d) Fruits

Name of Fruit	Energy content (Kcal. per 150 g)	Protein content (g. per 150 g.)	Calcium content (mg per 150 g.)	Iron content (mg per 150 g.)
1. Mango (ripe)				
2. Orange				
3. Guava (country)				
4. Papaya (ripe)				

B. Identify the rich sources of carbohydrate, protein, fat, vitamin A, iron and calcium in your family's diet. Can you suggest improvements? Use the following formats to record your answer.

Sources of carbo-hydrate	Sources of protein	Sources of fat	Sources of vitamin A	Sources of iron	Sources of calcium

Diet practices which need improvement	Suggestions

Note for Teachers

Teachers can encourage students to calculate the nutritive value of foods in their own region (which may not be listed in the table provided). A useful reference published by Indian Council of Medical Research (ICMR) is as follows.

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FOOD COMPOSITION TABLES
(Nutritive Value per 100 g edible portion)

Cereals

Name	Energy (Kcal.)	Protein (g.)	Calcium (mg.)	Iron (mg)
Bajra	361	11.6	42	8.0
Rice (raw, milled)	345	6.8	10	0.7
Maize (dry)	342	11.1	10	2.3
Wheat (whole)	346	11.8	41	5.3

Pulses

Name	Energy (Kcal.)	Protein (g.)	Calcium (mg.)	Iron (mg)
Bengal gram *dal*	360	17.1	56	5.3
Black gram *dal*	347	24.0	154	3.8
Lentils	343	25.1	69	7.58
Soyabean	432	43.2	240	10.4

Vegetables

Name	Energy (Kcal.)	Protein (g.)	Calcium (mg.)	Iron (mg)
Spinach	26	2.0	73	17.4
Brinjal	24	1.4	18	0.38
Cauliflower	30	2.6	33	1.23
Carrot	48	0.9	80	1.03

Fruits

Name	Energy (Kcal.)	Protein (g.)	Calcium (mg.)	Iron (mg)
Mango (ripe)	74	0.6	14	1.3
Orange	48	0.7	26	0.32
Guava (country)	51	0.9	10	0.27
Papaya (ripe)	32	0.6	17	0.5

(Source : Nutritive Value of Indian Foods (1985), by C. Gopalan, B.V. Rama Sastri and S.C. Balasubramanian, Revised and Updated (1989), by B.S. Narasinga Rao, Y.G. Deosthale and K.C. Pant (Reprinted 2007))

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B. Resource Availability and Management

7

Learning Objectives

After completing this section the learner is able to—

- describe time and space as important resources.
- analyse the need for managing time and space.
- discuss ways of managing time and space.
- discuss tools in time management.
- explain the principles of planning space.

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As you have learnt in the previous chapter, resources are possessions, material or funds which can be used to achieve goals. You have also learnt that money, time, space and energy are some examples of resources. These resources are assets for an individual. They are rarely in abundant supply and are also not equally available to everyone. Therefore, to achieve our goals appropriate management of all the resources that are available to us is important. If these resources are wasted or not utilised properly we may be hindered in reaching our goals.

Timely and efficient management of resources enhances their optimism utilisation. In this chapter, you will learn about **time and space management.** Money as a resource and its management will be dealt with in Unit IV.

7B.1 Time Management

Time is limited and irreversible. Time is measured in years, months, days, hours, minutes and seconds. We are provided with 24 hours of time each day to use it as we like. The key is how we use that time. If not managed properly, time keeps slipping away inspite of our effort to control it. No

matter how important and valuable an individual may be, one cannot stop time, nor slow it down, or speed it up. Once passed, time can never be regained.

In today's fast changing lifestyle, our demands and responsibilities at home, at school and at work have increased. This has made the need for managing time very important. To be successful it is essential to develop time management skills. People who use these techniques become high achievers in all walks of life, from agriculture to business to sports to public service in all other professions and personal life. Time management allows one to have adequate rest and recreation along with work.

The principle of time management is to **concentrate on results, not on being busy**. People often spend their days getting anxious about the unfinished task, but achieve very little, as they do not concentrate on what matters the most– **time**. For example, some students may spend their time worrying about examinations rather than actually studying for them.

All time management begins with planning. A **time plan** is necessary. A time plan can be defined as an advance schedule of activities to be performed in a given time period.

How good is your time management?

Before understanding the steps in time and activity planning, it is essential to determine how effective your own time management is. How often are you able to complete the task planned? Are you able to efficiently complete your weekly, daily or hourly work? For most of us, it seems that there is just never enough time in the day to complete all our activities.

ACTIVITY 1

The activity given below will help you identify your own time management skills.

Instructions: Score the questions given below and determine how well these statements describe you. The following are the ratings for your answers:

Not at all = 1
Rarely = 2
Sometimes = 3
Often = 4
Very often = 5

Examples: If for the first question the answer of your choice is 'often', then write a score of '4' in the respective box, and if your answer is 'rarely' you may write your score as '2' and so on.

After answering all the questions add your scores across all the questions to get the final total.

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Question	Not at all	Rarely	Some-times	Often	Very often
1. Are you able to complete your highest priority tasks during the day?					
2. Are you able to place all your tasks according to their priority?					
3. Are you able to perform your tasks in the given time period?					
4. Do you keep separate time for planning and scheduling?					
5. Do you keep track of the time spent on the jobs done by you?					
6. How often are you able to work without distractions and interruptions?					
7. Do you do goal setting to help you decide the various tasks you would work on?					
8. Do you keep extra time margin in your schedule to deal with 'the unexpected'?					
9. Do you prioritise the importance of any new assignment given?					
10. Are you able to complete your task without being pressured by deadlines and commitments?					
11. Are you able to work effectively on important tasks because of distractions?					
12. Are you able to complete your work at the work place instead of taking it home?					
13. Do you prepare a "To do" list or an action programme before carrying out the tasks?					
14. Do you consult persons with experience before setting priorities for a given task?					
15. Do you consider whether the task would be worth the time put in, before you start your task?					

Total =

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Score Interpretation

Score	Comment
46-75	You are managing your time very effectively! However, check the section below to make it even better.
31-45	You are good at some aspects, but there is scope for improvement elsewhere. Focus on the key issues in the section below and you will most likely find that work becomes less stressful.
15-30	The good news is that you have a great opportunity to improve your effectiveness at work for long term success! However, to realise this you have to improve your time management skills.

Steps in time and activity plan

(a) Start your work as quickly as possible. Do not waste time in avoiding or delaying the task. When a student reaches home, she/he should relax for a while, have a meal and then start with the school work without postponing it for the end of the day.

(b) Get into a routine every day. Choose a time to accomplish certain tasks, such as completing school work, doing household chores; and then stick to the routine activities. The student should make an everyday routine to complete work in time, without any delay.

(c) Prioritise your tasks. Before picking up any new task make sure it does not impact the already existing activities. Do not undertake too many activities at a particular time. If the time available is less and work is more then keep the optional tasks for a later time and complete compulsory activities first. For example, if the student has a class test, she/he should first study for the test, then do homework and later get involved in other activities.

(d) Do not commit yourself to unimportant and low priority tasks. Learn to say 'No'. If you have less time and more tasks in hand, you should be able to say 'No' to the tasks which are not very important. For example, the student can avoid watching television, if she/he has to complete a task for the next day.

(e) Divide the big tasks into a series of small manageable activities. The day's school work (big task) can be divided into smaller tasks by dividing the work as per different subjects.

(f) Do not waste energy and time on tasks which do not need much attention.

(g) Deal with a task one at a time till it is completed or decide when to deal with it. Do not put it aside before completion.

(h) Arrange 'start' and 'stop' times to schedule activities. Appropriate time should be allotted to each subject without spending too much time on each subject.

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(i) Make a schedule of your activities and tasks. This will help to effectively manage time allocated to each task. A proper time schedule should be prepared for the entire day, which must always include leisure time.

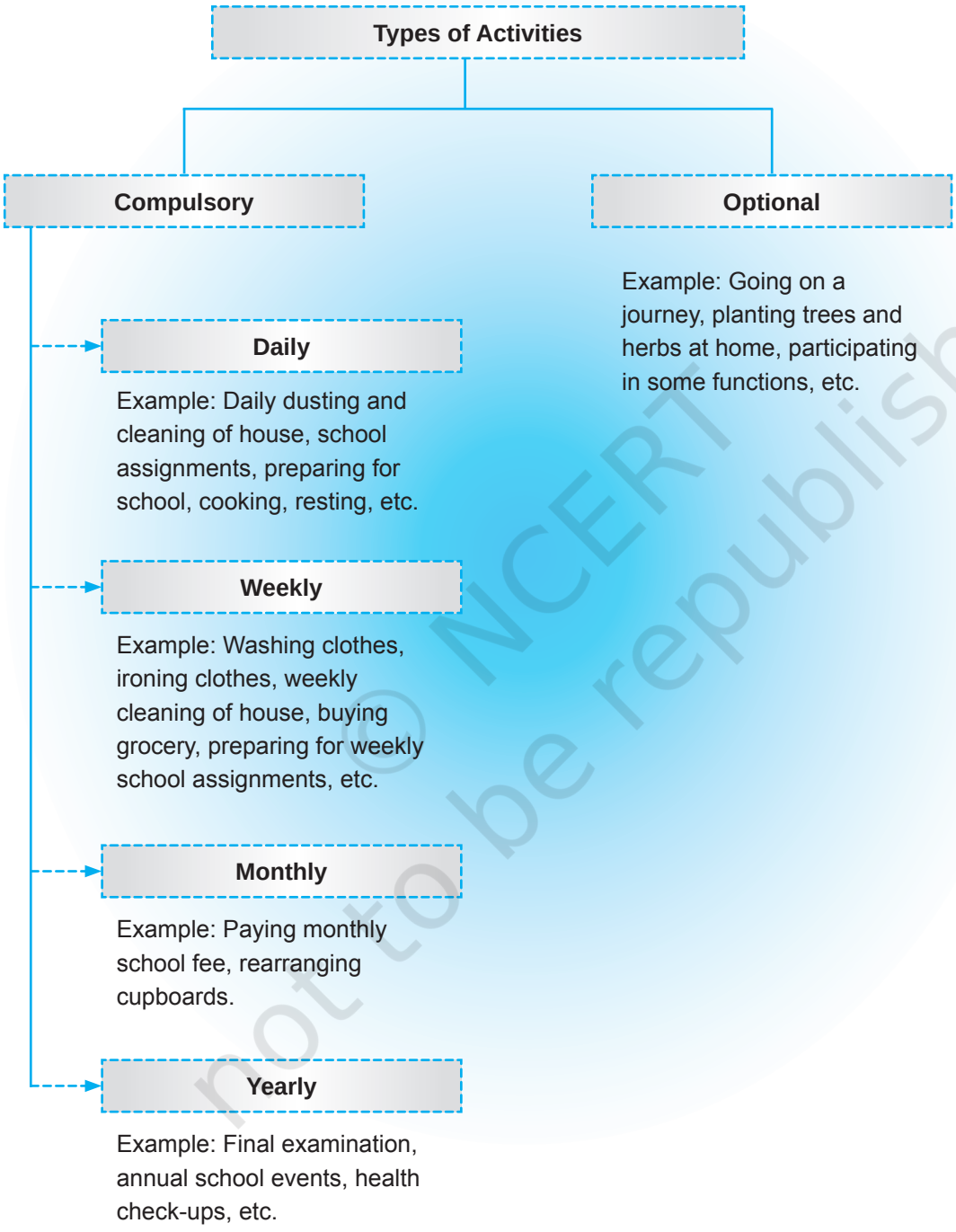

Figure 1: Types of Time Schedules

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Activity 2

An example of a time and activity plan of a student studying in Class XII, who lives in a small town and lives near the school, is given below. In the next column write your own time and activity plan.

	Time Plan of a Student	Your Time Plan
5:00 am	wakes up	
5:00 am – 6:00 am	daily personal activities	
6:00 am – 7:00 am	studying/helping in kitchen work	
7:00 am – 7:30 am	bathing and getting ready for school	
7:30 am – 7:50 am	breakfast and reading newspaper	
7:50 am – 8:00 am	reaching school	
8:00 am – 2:00 pm	in school	
2:00 pm – 2:10 pm	reaching home	
2:10 pm – 3:00 pm	changing clothes, washing hands and face, eating lunch, etc.	
3:00 pm – 4:00 pm	Resting/sleeping	
4:00 pm – 6:00 pm	studying and completing school related work	
6:00 pm – 8:30 pm	playing outdoor, leisure time, watching TV, spending time with parents, siblings, and friends, etc.	
8:30 pm – 9:00 pm	Dinner	

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9:00 pm – 10:00 pm	studying and preparing school bag for next day	
10:00 pm – 5:00 am	Sleeping	

Time plans are made according to the individual needs of a person. Every individual has different goals and requirements, and therefore, a different routine. For example a time plan for a student is very different from a time plan of a person who goes out to work.

Activity 3

	Time Plan of a Rural Homemaker	Your Mother's Time Plan
4:00 am	wakes up	
4.00 am – 5.00 am	feeds and milks the cow	
5:00 am – 5:30 am	bathes and offers prayer	
5:30 am – 7:00 am	cooks and serves meal to family	
7:00 am – 9:00 am	works in the fields	
9:00 am – 10:30 am	finishes other household chores like cleaning the house, utensils, washing clothes.	
10:30 am – 12:30 pm	rest period which includes activities like knitting, chatting with family members and neighbours, watching TV	
12:30 pm – 1:30 pm	serves lunch to the family and self	
1:30 pm – 3:00 pm	afternoon rest	
3:00 pm – 4:30 pm	fetches water for cooking and drinking	

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4:30 pm – 6:00 pm	other household chores	
6:00 pm – 7:30 pm	prepares dinner	
7:30 pm – 8:30 pm	serves dinner and has it herself	
8:30 pm – 9:30 pm	finishes the remaining household chores and winds up	
9:30 pm – 10:00 pm	watches T.V., goes to sleep	

Tips for effective time management

1. Create a simple "To Do" list

It helps you to identify the activities, reasons for doing them and a timeline for completing them.

S.No.	Activity	Day/date of completion	Reason for carrying out the activity

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2. Daily/weekly planner

DAY	Hours														
	A.M.					P.M.									
	7-8	8-9	9-10	10-11	11-12	12-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	9-10	10-11
Mon															
Tue															
Wed															
Thur															
Fri															
Sat															
Sun															

3. Long term planner

Use a monthly chart so that you can plan ahead. Long-term planners will also serve as a reminder to constructively plan time for oneself.

January	
February	
March	
April	
May	
June	
July	
August	
September	
October	
November	
December	

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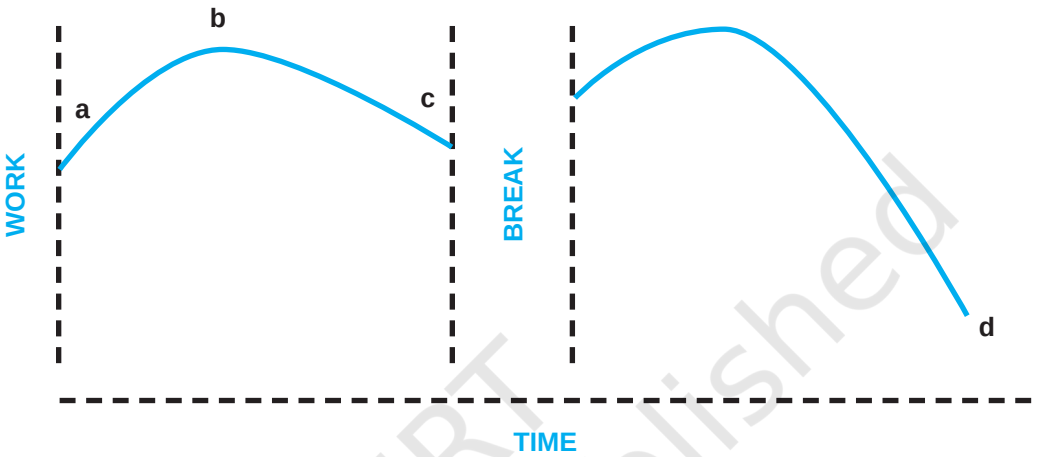
Tools in time management

Following are the tools which help in managing time effectively—

(i) **Peak load period**: It is the maximum load of work during a specified period of time. For example, early morning time or dinner time.



(ii) **Work Curve**: A device to trace the work against time.
Here, a to b is warming up period, c is plateau of maximum ability to do work and d is maximum fall due to fatigue.

(iii) **Rest periods/break periods** are defined as unproductive interruptions of working time. The frequency and duration of rest period is very important. It should neither be too long nor too short.

ACTIVITY 4

Identify your daily peak load and rest periods.

(iv) **Work simplification** can be defined as the conscious seeking of the simplest, easiest and quickest method of doing work. It implies proper blending and management of two important resources, namely time and human energy. It aims at accomplishing more work with a given amount of time and energy, or at reducing the amount of either or both to accomplish a given amount of work. In order to bring change in work procedure as well as to simplify it, three levels of changes are important. These include the following—

- *Change in hand and body motions:* It involves changes in hand and body motion only, keeping the same work tools and product. Many tasks can be completed with less effort by—

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(i) Eliminating and combining certain process as, for example
- Allowing dishes to dry on utensil racks eliminates the need to dry them by wiping.
- Making a list of all the items required from the market and buying them together rather than getting each item separately.

(ii) By improving the sequence and rhythm of work, for example
- Doing like tasks together – while cleaning the house, all the processes of dusting, sweeping and mopping should be done in continuation in all rooms together, rather than cleaning each room separately. This also helps in maintaining rhythm.

(iii) By developing skills at work – knowing and mastering a job well help to eliminate extra motions thereby saving both time and energy.

(iv) By improving body posture – i.e., maintaining a correct and good body posture (see Figure 2 below), using muscles effectively, keeping the body parts in alignment and finally carrying the maximum weight on the bony framework, thus releasing the muscles of all strains. For example, use of long handle on the broom instead of bending and sweeping in order to maintain a stable posture (see Figure 3).

Good Standing Posture – a good standing position is one in which the head, neck, chest and abdomen are balanced one upon the other, so that the weight is carried mainly by the bony framework and minimum effort and strain is placed upon the muscles and ligaments.

Similarly, **Good Sitting Posture** for work is a well-balanced and poised position. The weight is carried by the bony support of the skeleton thus releasing the muscles and nerves of all strain. The poise is such that as much adjustment is done as is necessary to carry out the work.

FIGURE 2: FIGURE SHOWING ALIGNMENT OF BODY PARTS IN LINE WITH GRAVITY

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Broom with handle of comfortable length

Broom with uncomfortable handle leading to bending of back and strain of back muscles

FIGURE 3

- *Change in work, storage space and equipment used:* This requires organising storage spaces, rearranging kitchen equipment, planning work surfaces with proper height and width according to the user, using labour-saving devices like pressure cookers, washing machines, microwave oven, etc., which help in saving time as well as hand motions.
- *Change in the end product:* These changes result from the use of –
  - Different raw materials – for example, using readymade ground spices instead of whole spices, using organic seeds to grow produce, etc.
  - Making different products from same raw materials – for example, making *kulfi* instead of ice-cream, *lauki paranthas* instead of *kofta* curry, etc.
  - Changes in both the raw material and finished product – for example, using ball pen instead of ink pen, etc.

7B.2 SPACE MANAGEMENT

Space is utilised by people to carry out various activities at home, outside the home and at workplace. You must have observed that a well-designed room gives a sense of spaciousness, while a room with similar dimensions, if not managed well, results in the room looking apparently cramped or cluttered. Space management involves planning of space, organising it as

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per the plan, implementing the plan in terms of its utilisation, and evaluating it in terms of achieving functionality and aesthetic appeal. A well-managed space not only offers comfort while working but also appears attractive.

Space and the home

Sitting, sleeping, studying, cooking, bathing, washing, entertainment, etc., are the major activities to be carried out in the home. To conduct each of these activities and the actions that may follow them, usually specific areas are identified in the home. Wherever there is space available, specified rooms are built to carry out such activities. Most urban middle Socio-economic Status (SES) homes are likely to have sitting room/area, bed room/rooms, kitchen, store room, bathroom and toilet, verandah/ courtyard (optional).

Besides the above, some homes may additionally have other rooms like dining room, study room, entertainment room, dressing room, guest room, children's room, garage (for scooter, car), stairs, passages, *puja* room, garden, terrace, etc. Let us learn, how to plan spaces?

Activity 5

Make a list of different rooms/areas in your house and the activities carried out in each of these. For example–

Rooms	Activities
Kitchen	Cooking

Principles of space planning

Space must be planned for its optimal utilisation. Following are the principles to be kept in mind while assigning/designing work areas in the house–

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(i) **Aspect**: 'Aspect' indicates the arrangement of doors and windows in the external walls of a building which allows the occupants to enjoy the nature in the form of sunshine, breeze, scenery, etc.

(ii) **Prospect**: 'Prospect' in its proper sense, is the impression or impact that a house is likely to make on a person who looks at it from outside. Therefore, it includes the attainment of pleasing appearance using natural beauty, positioning of doors and windows, and covering up of undesirable views.

(iii) **Privacy**: Privacy is one of the most important principles in space planning. Privacy requires consideration in two ways:

- *Internal privacy* : Privacy of one room from another is referred to as internal privacy. It is attained by careful planning in the house with respect to grouping, positioning of doors, provision of small corridor or lobby, etc. Internal privacy can be also be achieved by setting up screens and curtains. In some homes with large families separate sitting area is provided for women, ensuring their privacy.
- *External privacy* : This means privacy of all parts of a house from the neighbouring buildings or houses, public streets and by-ways. It can be a shade secured by carefully planning the entrance and covering it with a tree or creepers.

EXTERNAL PRIVACY – A HOUSE SECURED BY FENCE AND SHRUBS

ACTIVITY 6

Talk to members of your family from different age groups and ask them what they understand by privacy.

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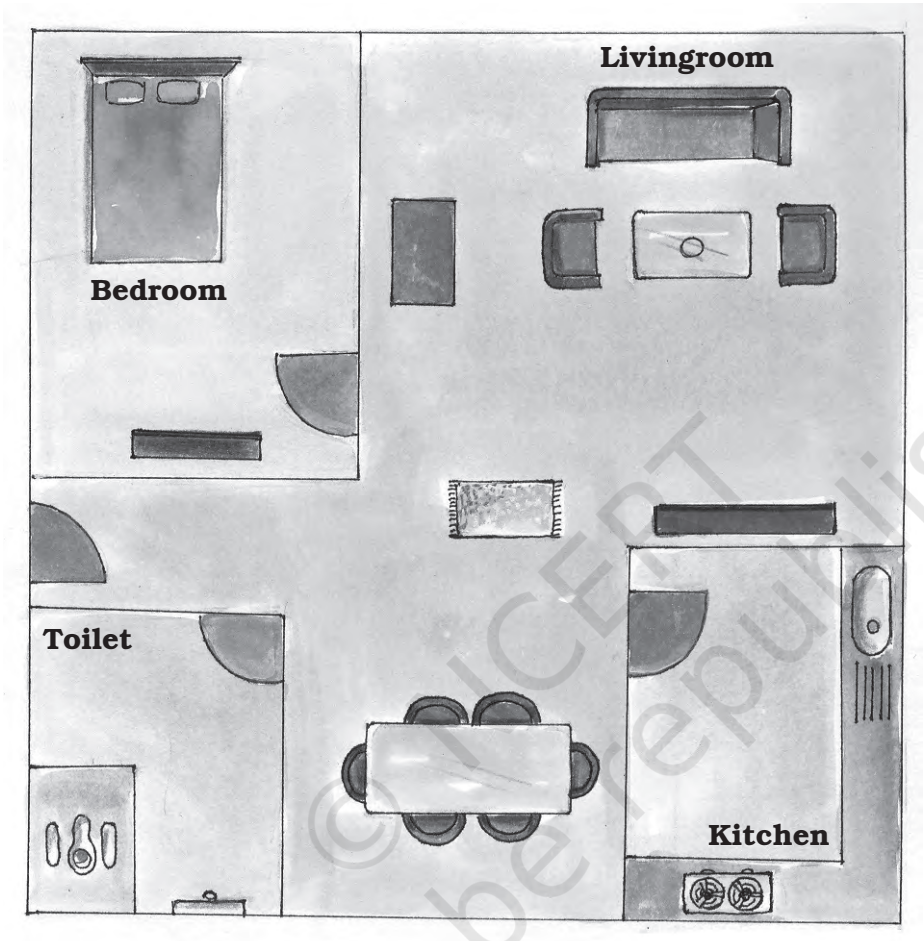
(iv) **Grouping**: It implies the outlook of rooms with respect to their relative position with each other. For example, in a building, the dining area must be close to the kitchen and the kitchen must be away from the toilet.



House plan

(v) **Roominess**: It is the spacious effect a room gives to those who live in it. The available space should be made use of fully. For example, one can have built-in wall cupboard, shelves and storage area so that the floor of the room is left free for various activities. In addition, the size and shape of the room, the furniture arrangement as well as the colour scheme used have a bearing on its roominess. Well proportionate rectangular room looks spacious compared to a square room of similar dimensions. Light colours make a room look more spacious than dark ones.

(vi) **Furniture requirements:** The rooms must be planned with due thought to the furniture to be placed there. Every room in a building should serve its purpose well. Care must be taken to place only

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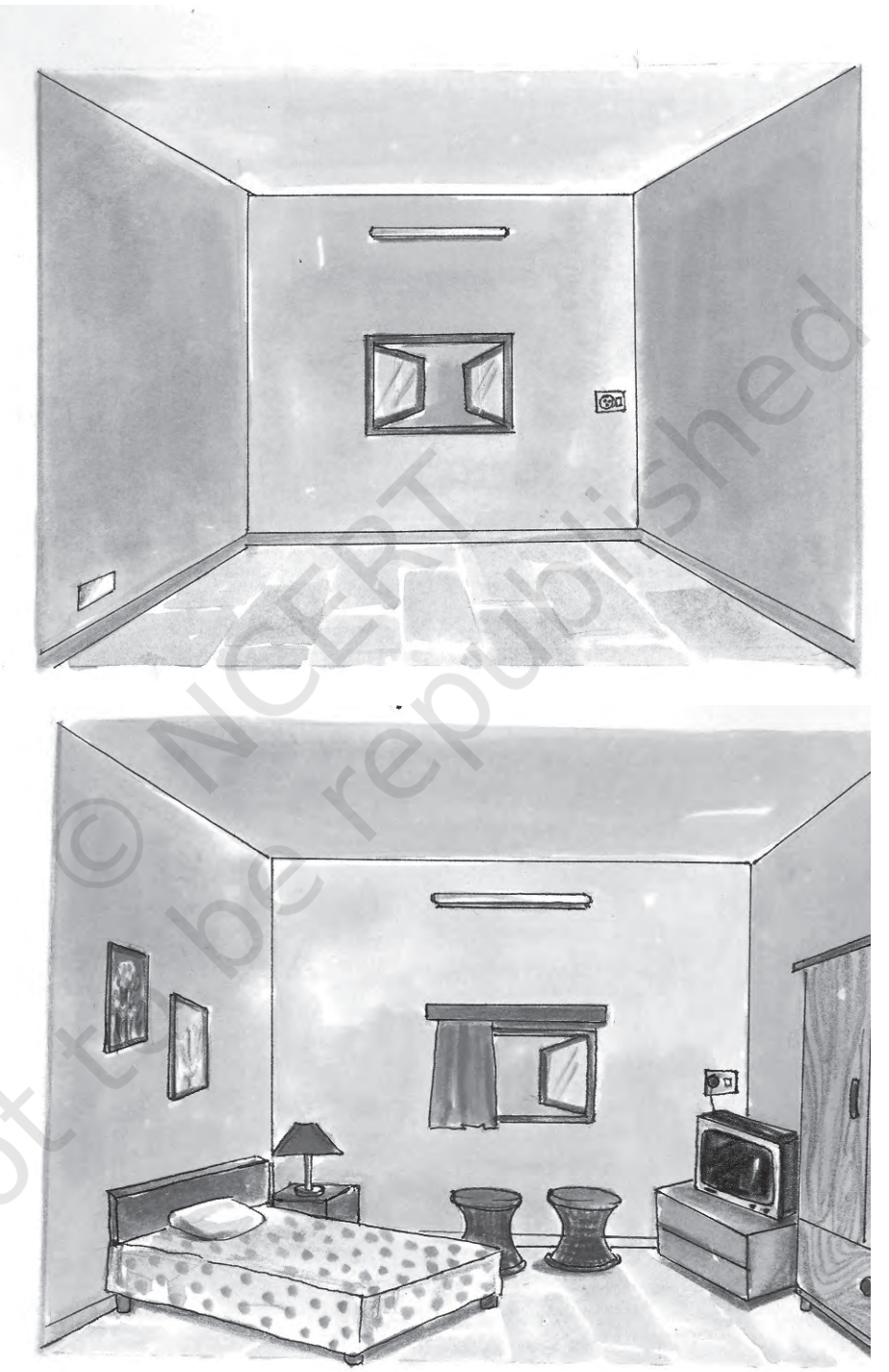
required pieces of furniture. Furniture must be arranged in such a way so that one gets free circulation spaces.



UNFURNISHED ROOMS, WHICH ARE LATER FURNISHED, MEETING ALL THE FURNITURE REQUIREMENTS

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(vii) Sanitation: Sanitation consists of providing ample light, ventilation, facilities for cleaning and sanitary conveniences in the following manner:

(a) Light: Light has two-fold significance, firstly it illuminates, and secondly, it helps maintain hygiene. Light in a building may be provided by natural or artificial sources. Windows, bulbs, tube-lights are some sources of light.

(b) *Ventilation:* It is the supply of the outside air into the building. Good ventilation is an important factor which affects comfort in the building or room. This is generally achieved by placing the windows, doors and ventilators such that they may allow as much breeze as possible. Windows, if placed opposite to each other, provide good ventilation. Lack of fresh air in the building may lead to headaches, sleepiness, inability to focus attention, etc. Ventilation may be natural or mechanical (using exhaust fan).

(c) *Cleanliness and sanitary conveniences:* General cleaning and up- keep of the building is the responsibility of the occupants, but even then some provision to facilitate cleaning and prevention of dust are necessary in planning. Sanitary conveniences include the provision of bathrooms, water closets and lavatories in a building. Lavatories and bathrooms in rural houses are constructed as a separate unit, usually in the backyard or the frontyard, away from the other rooms, thus maintaining hygiene.

(viii) Circulation: Air circulation from room to room should be possible. Good circulation includes an independent entry to each living space through a common space. It also ensures privacy to members.

A SCHOOL BUILDING

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(ix) Practical Considerations: While planning spaces, one may consider practical points such as strength and stability of the structure, convenience and comfort for the family, simplicity, beauty and provision for expansion in future. One should not economise by creating a weak structure.

(x) Elegance: 'Elegance' is the effect produced by the general layout of the plan. Without compromising on economy, the space plan should be aesthetically appealing.

The above mentioned principles when considered, aid in space planning and management.

In this chapter we learnt about two very important resources—time and space, and the efficient ways to use them. In the next chapter we shall learn about yet another significant resource – knowledge, and the ways in which it can be acquired. The processes of learning, education and extension are basic for knowledge acquisition.

Key Terms

Time management, Space management, Time plan, Activity plan, Work simplification.

REVIEW QUESTIONS

1. Describe time and space resources.
2. Why is time management necessary?
3. Discuss the steps in a time and activity plan.
4. What are the tools in time management?
5. Define space management. Discuss the principles of planning space inside the home.

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C. Textile Traditions in India

7

Learning Objectives

After completing this section the learner is able to—

- recognise the diversity of textile products produced in India since millennia.
- identify the areas associated with production of cotton, silk and wool fabrics.
- describe the concept of dyeing and its occurrence on textiles.
- explain the characteristic features of embroideries of different parts of the country.
- discuss the significance of prevailing traditions of textile production in the socio-cultural and economic setup of our lives.

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7C.1 Introduction

In the earlier chapter 'Fabrics Around Us' you became aware of the diversity of the textile products and their usage. Have you ever wondered how these came to exist, and how in India they are considered an important heritage? If you ever visited a museum, you must have noticed a section where fabrics and apparel are displayed. You may have realised that not only there are fewer exhibits in this section, they are also not as old as other objects. This is because fabrics decay much more quickly than bone, stone or metal. However, archaeological records depicting clothed human figures on wall and sculptures indicate that humans knew the art of making cloth even 20,000 years ago. We also learn about them from references in ancient literature and paintings on walls in caves and buildings.

Textile materials have fascinated humans since ancient times and have been an essential part of civilisation. People of all ancient civilisations developed techniques/technologies for utilising the raw material available

in their region. They also created their own distinctive designs and produced elaborately designed products.

7C.2 Historical Perspective in India

The manufacture of sophisticated textiles in India is as ancient as the Indian civilisation. Fabric has been used as a symbol while describing the creation of the universe in the *Rig Veda* and the *Upanishads*. The universe, in these texts, is described as 'a fabric woven by the Gods'. The appearance of Day and Night, as they bring light and darkness over the earth, are compared to the movement of the shuttle in the loom by the weaver.

Weaving is one of the oldest arts and fine fabric products have been made from very early times. Cloth fragments, as well as terracotta spindles and bronze needles, that have been found at the excavation site at Mohenjo-Daro, are evidence that the traditions of cotton spinning, weaving, dyeing and embroidery in India are at least 5000 years old. India was first among the ancient civilisations to discover colour and perfect the technique of application on textile materials, especially on cotton. Dyed and printed cotton fabrics were exported to other nations and they were known for their colourfastness properties. Classical (Greek and Latin) literature has reference to them, e.g., "colour on Indian fabrics is as lasting as wisdom".

Throughout the period of recorded history there are references extolling the excellence of Indian fabrics made from cotton, silk and wool. They were known for their fabric characteristics as also for designs produced on them through weaving, resist dyeing, printing and embroidery. They soon became coveted items of trade, helped in political linkages and influenced the establishment of such industries in other countries. From around 15th century onwards India was the greatest exporter of textiles ever known. The setting up of the various East India Companies by the European nations was associated with textile trade from India.

7C.3 The Three Main Fibres

Traditionally Indian fabric production is associated with three main natural fibres, which are cotton, silk and wool. Let us now discuss their significance.

Cotton

India is the home of cotton. Cotton cultivation and its use in weaving are known since prehistoric times. The spinning and weaving techniques developed here produced fabrics, which came to be known for their extreme fineness and decorations. Cotton travelled from India to all over the world. That it was a trade item is learnt from the material recovered

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from archeological digs in the ancient land of Babylon with *Harappan* seals. When the Romans and Greeks first saw cotton, they described it as wool that grew on trees.

The legends associated with cotton weaving are many. Dacca (now in Bangladesh) produced the finest fabric—the *mulmul khas* or the royal muslin. It was so fine that it was almost invisible and thus had poetic names; *baft-hava* (woven air), *abe-rawan* (flowing water), *shabnam* (evening dew). The *Jamdani* or the figured muslin traditionally woven in Bengal and parts of North India using cotton is one of the finest **brocade** products of Indian weaving.

In regular weaving, the filling yarn passes over and under the warp yarn in a specific sequence. But when **brocade** designs in silk, cotton, or gold/silver yarns are to be woven, these yarns are transfixed in between regular weaving. Depending upon the fibre content used for patterning there may be cotton brocades, silk brocades, or *zari* (metallic yarn) brocades.

Besides the proficiency in making cotton fabrics, India's crowning textile accomplishment was the creation of pattern in the cotton cloth with brilliant fast dyes. Until the 17th century, Indians alone had mastered the complicated chemistry of cotton dyeing, which was not mere application of pigments to the surface, but produced fast and lasting colours. Indian Chintz (printed and painted cotton cloth) had revolutionised European fashion and market. Indian craftpersons were '**the master dyers to the world**'.

Cotton is woven universally all over India. Super fine yarn is still spun and woven in many places, though the bulk production may be thick. The materials are made in a variety of designs and colours and find specific usages in different parts of the country.

Silk

Silk fabrics have been made in India since ancient times. We learnt in the earlier chapter that the origin of silk was in China. However, some silk must have been used in India as well. Silk weaving is mentioned as early as the 3rd century BC., and distinction is made between Indian and Chinese silk. The silk weaving centres developed in and around the capitals of kingdoms, holy cities or trade centres. As the weavers migrated, it helped in the development and creation of many new centres. Different regions in our country have specific silk weaving styles. Some of the important centres are–

Varanasi in Uttar Pradesh, which has an old tradition in weaving special styles. Its best-known product is the brocade or *kinkhwab*. Its splendour and elegance and the high cost of the fabric gave it its name—*kinkhwab* meaning something a person cannot even dream of or a fabric which is seldom seen in a dream or the golden (*kin*) dream (*khwab*).

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West Bengal is traditionally famous for its silk weaving. By using a loom similar to that of *Jamdani* weavers, the weavers of West Bengal weave a silk brocaded sari called *Baluchar Butedar*. This style originated from a place called Baluchar in Murshidabad district. It is now successfully being produced in Varanasi. Here the plain-woven fabric is brocaded with untwisted silk thread. The most characteristic feature of these sarees is their *pallav* or the end piece. It has unique designs, depicting scenes from epics, royal court, domestic or travel scenes with riders and *palanquins*. Mango motif is most commonly used in borders and *pallavs*.

Gujarat developed its own style of *kinkhwabs*. Very fine textiles were produced in Bharuch and Cambay, which were popular in the courts of Indian rulers. The *Ashavali* sarees of Ahmedabad are known for their beautiful brocade borders and *pallavs*. They have rich gold or silver metallic background on which patterns are woven with coloured threads, giving the fabric an enamalled appearance. Human, animal and bird motifs are frequently incorporated into the pattern as they are an integral part of Gujarati folk tradition.

Kanchipuram in Tamil Nadu is a famous brocade weaving centre in South India from ancient times. The traditional sarees display bird and animal motifs with rich brocaded *pallav*. Dark colours like red, purple, orange, yellow, green and blue predominate in South Indian fabrics.

Paithan, located on banks of Godavari River near Aurangabad in Maharashtra, is one of the oldest cities in Deccan region. It is famous for a special silk saree with gold inlay weaving for borders and motifs. The tapestry weave used in Paithan is the oldest technique of decorative weaving. It is known for its closely woven golden fabric. In the shimmering gold background, various patterns (*butas*, the tree of life, stylised buds and floral borders) are worked in red, green, pink and purple glow like jewels.

Tapestry weave utilises the principle of discontinuous weft or filling yarns, thus allowing multicoloured yarns to be used. It results in the fabric appearing the same on its face and reverse side.

Surat, Ahmedabad, Agra, Delhi, Burhanpur, Tiruchirapalli and Thanjavur are other traditionally renowned centres of *zari* brocade weaving.

Wool

The development of wool is associated with the colder regions like hills of Ladhakh, Jammu and Kashmir, Himachal Pradesh, Uttar Pradesh, hills of West Bengal, some N.E. states, Punjab, Rajasthan and a few places of Central and West India. Specialty hair, i.e., the hair of animals other than sheep, (mountain goats, rabbits and camels) have also been used in India.

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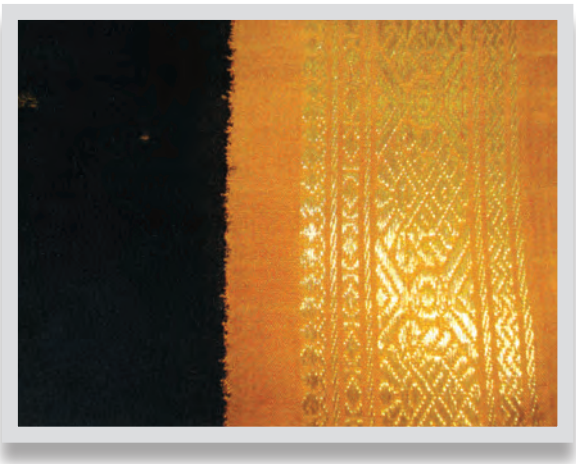

From Kanchipuram

Kinkhwabs

Baluchar Butedar

Piathani

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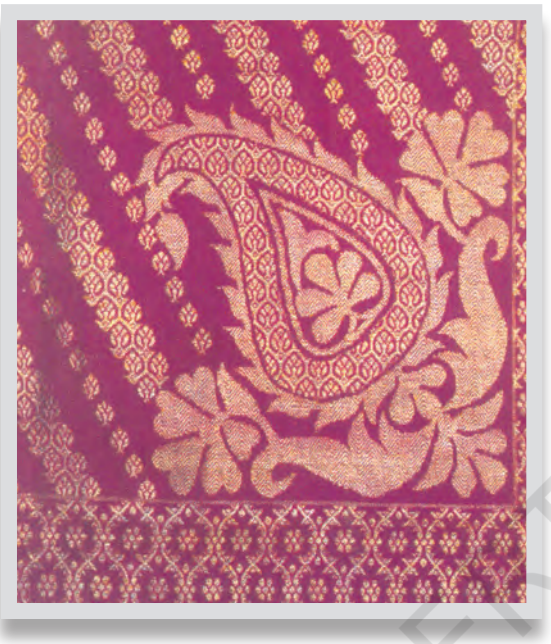

Banaras Brocade

Kullu Shawl

Kashmir Jamwar Shawls

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The earliest references of wool make mention of very fine hair obtained from mountain goats and some deer like animals.

Kashmiri literature of 11th century confirms the weaving of multicoloured woolen fabrics during the period. From the 14th century, the Persian influence led to the production of *shawls*. It utilised the most complex tapestry weave in a multitude of colours and intricate patterns. The best shawls were made from *pashmina* and *shahtus*, the hair of mountain goats. The Mughal emperors were responsible for promoting this art and shawls of Kashmir became world famous. Like the printed cotton these were a major export item from 18th century. Later embroidery was also introduced in shawls. The designs of the *shawls* copy the beauty of nature of Kashmir. The mango motif, also known as *paisley*, is seen in countless varieties and colour combinations.

Akbar is said to have introduced the style of *Jamawar* shawls. These were large *shawls* designed in a manner, which were also suitable for making garments (*Jama,* i.e., cloak and war meaning yardage). You may have noticed in paintings in museums or illustrations in books, the Mughal rulers usually have large shoulder wraps in intricate designs.

The *shawls* of **Himachal Pradesh** are mostly woven in angular geometrical motifs grouped in straight horizontal lines, bands and stripes, one or two placed vertically as well. Kullu valley specifically is known for shawl weaving and several other woollen fabrics like *pattu* and *dohru* (wraps for men).

In the recent years *shawl* weaving in other places have also gained importance. Special mention can be made of Amritsar and Ludhiana in Punjab, Uttrakhand and Gujarat.

7C.4 Dyeing

We have already learnt that the history of dyeing in India is very old. Before the middle of 19th century the dyes were obtained only from natural sources. Most of the dyes used were from plants – roots, bark, leaves, flowers and seeds. Some insects and minerals also yielded colour. The analysis of the old samples confirms that Indians had a deep knowledge of chemistry of dyes and techniques of dye application to produce fabrics, renowned for their colourfastness properties.

Resist dyed fabrics

The oldest form of designing with colour is resist dyeing. Having perfected the art of dyeing, it must have been discovered that if certain parts of

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material were prevented from absorbing the dye, it would retain its original colour and thus appear designed. The resist material could be thread, pieces of fabric, or substances such as clay and wax that offer physical resistance. The most common method of resist is tying with thread. There are two methods of tie and dye fabrics produced in India; fabric tie and dye and yarn tie and dye. In both cases the part where design is required, is tied up by tightly winding a thread around it and dyeing. During the dyeing process, the tied areas retain the original colour of the ground. On drying, some tied up parts are opened and some more tied and dyed again. The process can be further repeated for more colours, always proceeding from light to dark colours.

Tie and dye has a ritualistic significance. Among the Hindus, the thread tied around the wrist before any religious ceremony is white, yellow and red tie-dyed. Tie and dyed fabrics are considered auspicious for marriage ceremonies; the dress of the bride and turbans of male members are generally of these fabrics.

(i) **Fabric tie and dye:** *Bandhani, chunari, laheria* are some of the names of materials in which the pattern is created by tie-dyeing the fabric after it is woven. A typical tie and dye design is *bandhej* where the patterns comprise innumerable dots; another is the *laheria* type where the pattern is in the form of diagonal stripes. Gujarat and Rajasthan are the homes of this type of fabrics.

(ii) **Yarn tie and dye:** This is a complicated process of producing designed fabrics. These are known as *Ikat* fabrics. Fabrics are produced by a technique in which the warp yarns or filling/weft yarns or both are tie-dyed before weaving. Thus, when the fabric is woven, a specific pattern appears depending on the dyed spaces of the yarns. If only one yarn, i.e., only warp or weft yarn is tie-dyed, it is called single *Ikat*; if both yarns are so treated, it can be combined *Ikat* (both are creating separate patterns) or double *Ikat* (a unified pattern is created).

The *Ikat* artisan is not only proficient in the art of dyeing; she/he also has the technical knowledge of weaving. The process consists of calculating the amount of warp and filling yarns required for the article to be made. The tying of the yarn and weaving it after dyeing require great expertise so that warp and filling yarns match to produce the design.

Gujarat has the richest tradition of *Ikat* weaving. *Patola* is the most colourful double *Ikat* sari made in silk. Its manufacture is concentrated in Patan, in Mehsana district. Apart from geometrical design patterns inspired from local architecture, other designs are flowers, birds, animals and dancing dolls. The colours most commonly used are red, yellow, green, black and white. They tend to flow into one another without the harshness of outline.

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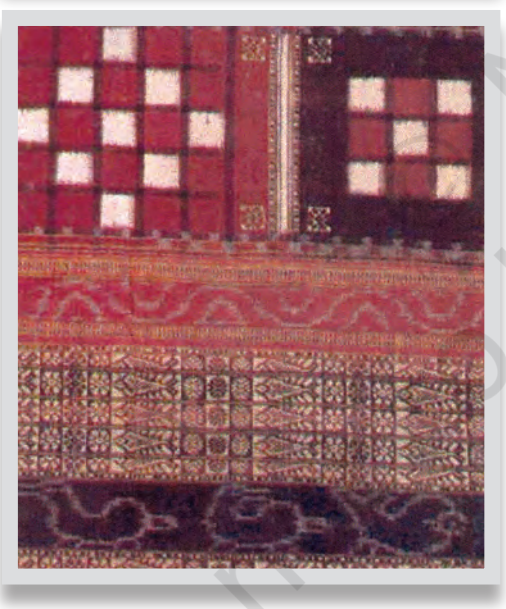

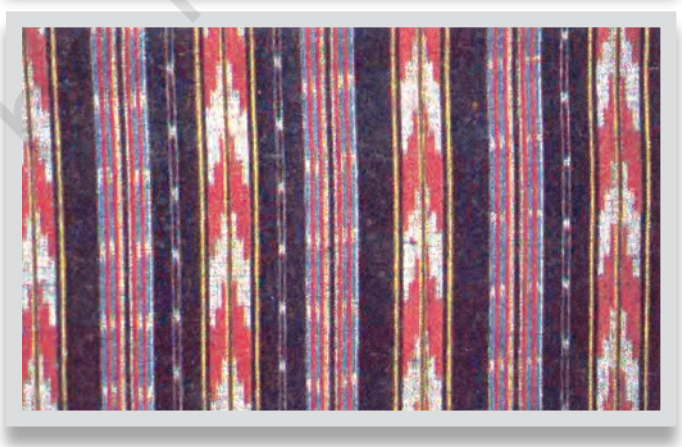

Ikat Fabrics

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Ikat Fabrics

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Orissa is another region where *Ikat* saris and fabrics of cotton and silk are produced. The process here is known as *Bandha*, which may be single or combined *ikat*. Compared to *Patola*, the designs here have a softer and curvilinear quality. They are also characterised by the addition of extra weft yarn woven in small figurative designs.

Pochampalli and *Chirala* in **Andhra Pradesh** have the tradition of production of cotton *ikat* fabrics called *Telia Rumals*. These were designed 75–90 cms. square pieces of fabric usually woven as a pair. The coarser ones were used as *lungis*, shoulder cloth or loincloth by the fishermen community and the finer ones as *dupattas* or veils.

7C.5 Embroidery

Embroidery is the art of surface ornamentation of fabric with threads of silk, cotton, gold or silver using needle or needle like tools. Embroidery, an ancient art form, referred to as painting with a needle, was practised in many parts of the world. In India too it has been practised from very early times and there is evidence to indicate that embroidery was prevalent all over the country–

- at all socio-economic levels – from the nomadic cattlemen to members of royal households.
- on all kinds of fabrics – from the most coarse cotton and camel wool to finest of silks and *pashminas.*
- with all materials and threads – cotton, wool, silk or *zari* along with *cowrie* shells, bits of mirror and glass, beads, gems and coins.
- used in making varied articles – personal clothing, household use, home decoration, offerings for religious places and decorative items for their animals and cattle.

Embroidery is generally regarded as a homely handicraft, an occupation that women undertake during their leisure hours, mainly to ornament or decorate articles of apparel or household use. Nevertheless, certain embroideries became items of trade within country and also in different parts of the world. Let us now have a glimpse into some of the styles, which are being commercially produced today.

Phulkari

Phulkari is the art of embroidery of Punjab. It is the term used for both the embroidery and the *chaddar* or shawl made with this type of embroidery. *Phulkari* means 'flower work' or a bed of flowers. The other term *bagh* (literally a garden) has also the same connotation. *Phulkari* was mainly a domestic craft, executed by the girls and ladies of the household and sometimes by women servants under their directions. The embroidery is

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done on coarse cotton (*khaddar*) material with untwisted silk floss called *pat*. In the heavily embroidered *baghs*, the embroidery covers the fabric so completely that the base colour of the fabric can only be seen on the reverse side. Traditionally, this embroidery was associated with wedding ceremonies and *baghs* were made by the maternal grandmother for her grand-daughter or by the paternal grandmother for her grand daughter-in-law.

Kasuti

Kasuti is the term used for the embroidery of Karnataka. *Kasuti* word is derived from the Persian word *kashida*, which means embroidery. Like *phulkari*, it is also a domestic craft mainly done by women. This is the most subtle form of embroidery, where the embroidery threads follow the pattern of the weave of the fabric. It is done on silk material with fine strands of silk threads. Even the colours used tend to blend with the background material. The main designs seem to be inspired from the temple architecture of the area.

Kantha

Kantha embroidery of Bengal is done on a base prepared by 3-4 layers of old cotton *sarees* or *dhotis*. The embroidery is like quilting – small running stitches going through all the layers of the base material. The article thus produced are also known as *Kantha*. This embroidery may have had its origin in darning to strengthen the worn-out areas, but now the stitches fill up the shapes that are drawn on it. It generally has a white base with embroidery in multi-coloured threads, which were originally pulled out from borders of old *sarees*. The articles made vary from small comb case and wallet to shawls of various sizes. There are also *kanthas* with ritualistic importance made for presentation to religious places or for use on special occasions.

Kashida

Kashida is the general term used for embroidery in Kashmir. The two most important embroideries are *suzani* and *zalakdozi*. Kashmir being the land of wool, the embroidery is done on woollen fabrics – from the finest of shawls to medium thickness cloaks like '*pherans*', to thick *namdas* used as floor coverings.

On shawls and fine woollens, perhaps the embroidery had its origin in repairing the defects that occurred during weaving. Later the multi-coloured weaving patterns were copied, to which were added the styles of Chinese embroideries like satin stitch and long and short stitch. The

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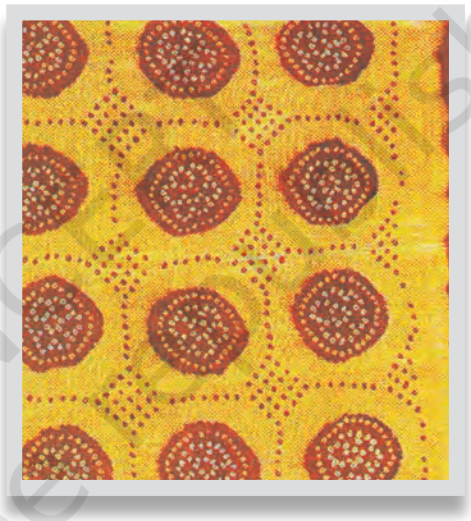

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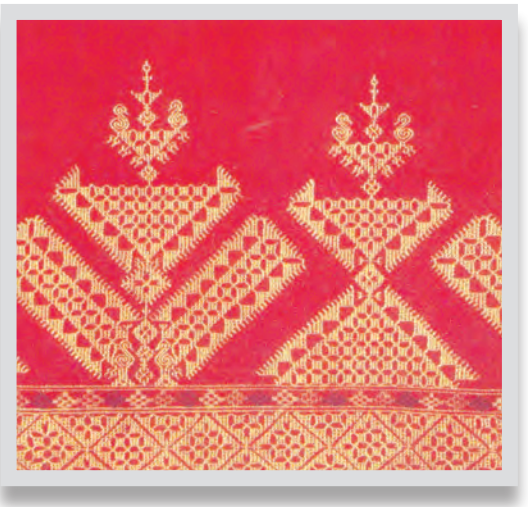
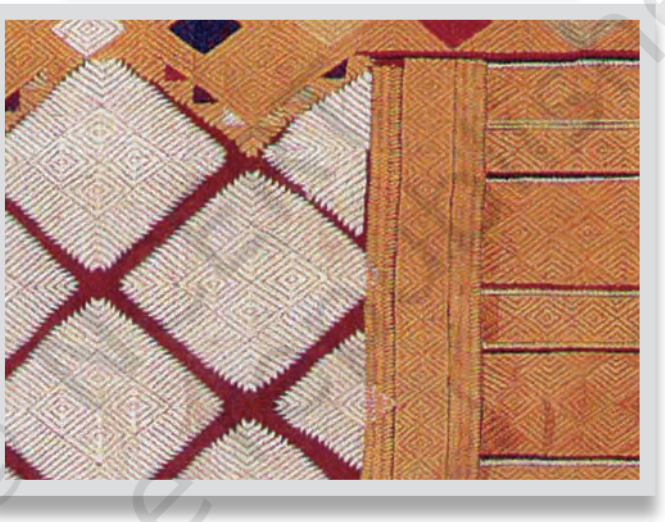
Tie and Dye Fabrics





Phulkari Embrodery

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suzni embroidery includes all the stitches that lie flat on the surface and also show uniformity on both sides of the material. This embroidery is done with silk threads, in a multitude of colours, and shades to make the designs look natural.

> The twill tapestry technique that was used for weaving often required small corrections and alterations. This was done like embroidery repeating the pattern of the weave, thus was called darning. The embroiderers in Kashmir are still referred to as *rafugars,* i.e., darners.

Zalakdozi is the chain stitch embroidery done with *'ari'* – a hook like the cobblers use. Originally it was done mainly on *namdas*, but now it is done on all kinds of materials, including *shawls*. Unlike the other embroideries discussed so far, Kashmir embroidery is a commercial activity, done by men folk and thus caters to the demand of the buyers.

Chikankari

Chikankari of Uttar Pradesh is the embroidery, which was commercialised at a very early stage. Although ladies do the main work, the master craft persons and organisers of the trade are mainly men. Lucknow is considered the main centre for the work. Originally it was done on white material with white thread. The main effects produced are shadow work by embroidering on the wrong side of the material, net like surface by tightening the yarns of the fabric with embroidering, and raised patterns on the face of the fabric by knotting stitch resembling rice or millet grains. The past few years have also seen the inclusion of *zari* threads, small beads and shiny discs (*sitara*) incorporated in the designs. Since it is a commercial activity, the designs and styles keep changing with fashion.

Gujarat has a very rich tradition in embroidery

It has basically been a land of nomadic tribes who have thus been responsible for amalgamation of designs and techniques of various cultures. Here embroidery is used for all aspects of life; decoration of the doorways with *torans* or *pachipattis* and walls with *chaklas* or *chandrawas*, ganesh *sthapnas* (all these are important in a nomadic lifestyle), garments for men, women and children in styles specific to various tribes, coverings for cattle, horses, elephants. Many of the embroideries are known by the names of the tribes – *Mahajan, Rabari, Mochibharat, Kanbibharat,* and *Sindhi*. Most of the colours used are bright and loud.

Appliqué work in Gujarat has its own style. It is a patchwork, in which the pieces of fabric with different designs are cut in different sizes and shapes and sewn on a plain background. This is used mainly on household items.

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Bead work of *Saurashtra* and *Kutch* is also an important art. It is not an embroidery, but interlacing of different coloured beads through a network of threads to create coverlets for utensils, hangings, purses, etc.

The close proximity of the states of Gujarat and Rajasthan, and because Rajasthan also has a tribal population has resulted in embroidery in a similar style. The colours and the motifs used vary between the tribes and the occasions for which they are produced.

Chamba rumals

Chamba rumals, from the erstwhile hill state of Chamba in Himachal Pradesh were made mainly for covering trays of gifts, when being presented to dignitaries or special guests. They depicted mythological scenes similar to *Pahadi* Paintings, by using running stitch in outline and darn-stitch in filling. At their best, the scenes appeared the same on either side of the textile.

7C.6 CONCLUSION

India has beautiful textiles which have been recognised the world over for their beauty and craftsmanship. Repeated and persistent invasions, migrations, political upheavals and many other ups and downs led to a synthesis that enriched the textile craft of India. The richness and diversity of contemporary form of art practised in India owes much to the coexistence of numerous cultural strains on its soil.

Specific geographical regions in India have age-long traditions associated with fabric production. This is in terms of different fibre groups – cotton, silk and wool and different manufacturing processes – spinning, weaving, dyeing and printing and surface ornamentation. With changing times, the production centres have evolved their own grammar in terms of colour, design and ornamentation and their usage for specific products. A large number of such centres continue to be important in the social and economic life not only for the production of items associated with religious and social rites, also in their effort to make a statement which fits into contemporary usage. Thus they are making an effort to go in for product diversification and alternate usage of traditional textiles. Gradually the emphasis is also shifting from customised products to mass production.

Almost all the traditions of Indian textiles have survived. New design development has only enriched these age-old traditions. Numerous government and non-government organisations, along with many academic institutions, have joined hands to preserve, revive and contemporarise the textile traditions.

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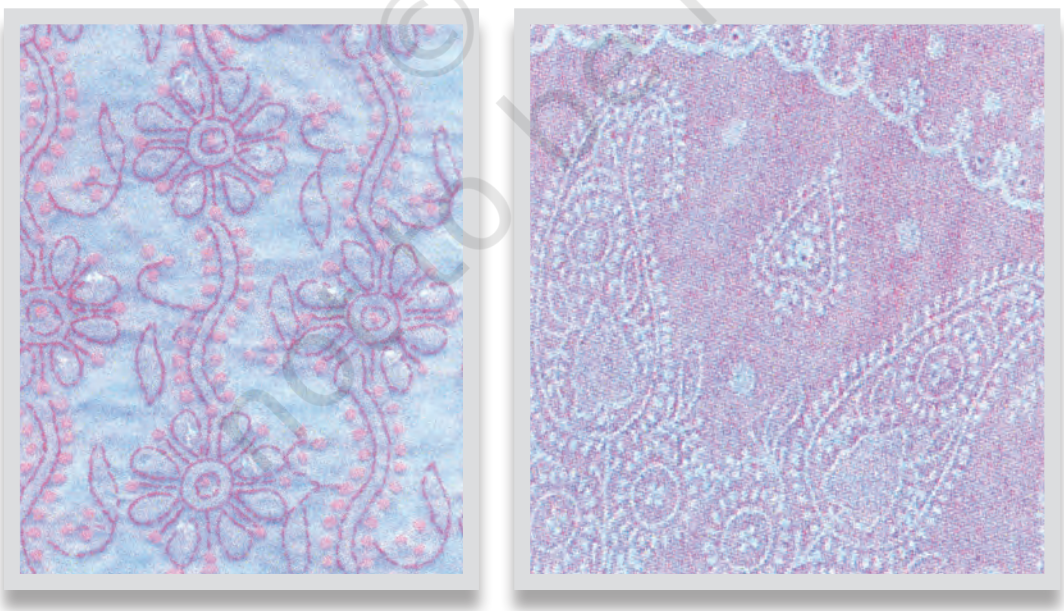
Kasuti Embrodery



Chikan Kari Embrodery

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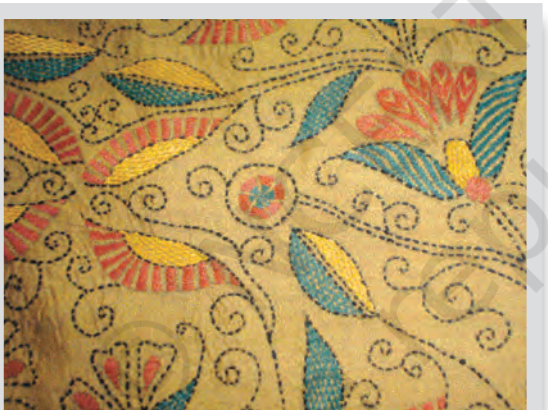
Kantha Embrodery



Chikan Kari

Chakla

Toran

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Key Terms

Brocade, *Mulmul, Jamdani, Kinkhwab,* Shawl, Tapestry, Tie and Dye, *Ikat, Patola,* Embroidery, *Phulkari, Kashida, Chikankari.*

Review Questions

1. From which historical sources of information can one learn about the antiquity of Indian textile art?
2. What are the two aspects of cotton production which made the Indian fabrics world famous?
3. Name some of the areas associated with silk brocade weaving. What are the special characteristics of each?
4. Why were the Indians called 'master dyers' *to the world*?
5. What do you associate with the following terms: *phulkari, kasuti, kashida, kantha* and *Chikankari*.

Practical 11

Textile Traditions in India

Theme Documentation of traditional textile art/craft of neighbouring area
Task Make a folder or catalogue giving information and pictures of traditional textile art and craft of any one selected area.

Purpose of the practical: Indian craft and its millions of prastising craft people are a huge and important resource of traditional knowledge and indigenous technologies. It will help the students to understand and appreciate the craft traditions of India. They will be able to collect relevant information and develop their creative skills in expressing textile traditions. Also it is a means of linking rural and urban youth.

Conduct of the practical: Visit a nearby exhibition or craft *mela* or museum to collect information on selected textile craft in terms of origin/history, fabrics, techniques, colour, design and products of the selected craft. Present it in the form of a folder or a catalogue.

Craft could be associated with any one more of fabric production processes – spinning, weaving, dyeing, printing or embroidery.

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APPENDIX

Syllabus

Human Ecology and Family Sciences

(Classes XI-XII)

Rationale

The curriculum in Human Ecology and Family Sciences (HEFS), formerly known as Home Science, has been framed keeping in view the principles of the National Curriculum Framework-2005 of the NCERT. Traditionally, the field of Home Science encompasses five areas, namely, Food and Nutrition, Human Development and Family Studies, Fabric and Apparel, Resource Management and Communication and Extension. All these domains have their specific content and focus that contribute to the study of the individual and the family in Indian socio-cultural context. The new curriculum has attempted to break away from the conventional framework of the discipline in significant ways. In the new conceptualisation, the boundaries between different areas of the discipline have been dissolved. This has been done to enable students to develop a holistic understanding of life in the home and outside. A special effort has been made to communicate respect for every student's life at home and in society by making the curriculum appropriate for both boys and girls, living in different contexts, including those who are homeless. It has also been ensured that all the units address, in their content, the significant principles of equity, equality and inclusiveness. These include gender sensitivity, respect for diversity and plurality in relation to rural-urban-tribal location, caste, class, value for both traditional and modern influences, concern for society and pride in national symbols. Additionally, the novel approach has made concerted efforts, to integrate learning at school by building bridges with other subjects in the sciences and social sciences.

The practicals have an innovative and contemporary character and reflect the utilisation of new technology and applications that would strengthen critical engagement with the lived realities of people. More specifically, there is a deliberate shift to field-based experiential learning. The practicals are designed to foster critical thinking. Further, conscious effort has been made to move away from stereotyped gender roles thus making the experiences more inclusive and meaningful for both boys and girls. It is imperative that the practicals are conducted keeping in mind the resources available with the family and community.

The course adopts a developmental framework in Class XI using the life-span approach, starting with adolescence, the stage of development being experienced by the student. Beginning with one's own stage of development would instill interest and enable identification with the physical and emotional changes that the student is undergoing. Following this is the study of childhood and adulthood. In each unit, the challenges and concerns have been addressed along with the activities and resources necessary to meet these challenges.

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For Class XI the 'self and family' and the 'home' are focal points for understanding the dynamics of individual lives and social interaction. The rationale for using this approach is that it will enable the adolescent student to understand herself/himself in the context of the family, which in turn is nested within the wider Indian socio-cultural milieu.

For Class XII, the emphasis is on 'work and careers' through the life-span. In this context, work is perceived as essential human activity that contributes to the development and sustenance of individuals, families and society. Its value is not linked only to its economic ramifications. The student will be helped to explore the significance of work, jobs and careers and their interrelationship. To understand this concept, the student will be imparted life skills and work skills in the respective areas of HEFS. This will facilitate the acquisition of basic skills and orientation to advanced professional skills needed for specialisation in the selected fields discussed in the course. It is significant that these skills will be useful for the student in her/his personal-social life, as well as serve as a springboard for pursuing a career in the future.

Objectives

The Human Ecology and Family Sciences curriculum has been framed to enable the learners to

1. develop an understanding of the self in relation to family and society.
2. understand one's role and responsibilities as a productive individual and as a member of one's family, community and society.
3. integrate learning across diverse domains and form linkages with other academic subjects.
4. develop sensitivity and undertake a critical analysis of issues and concerns of equity and diversity.
5. appreciate the discipline of HEFS for professional careers.

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Class XI

PRACTICALS

1. Study of physical self with reference to:
   (a) Age, height, weight, hip size, round chest/bust, round waist
   (b) Age at menarche: girls
   (c) Growth of beard, change in voice: boys
   (d) Colour of hair and eyes
2. Understanding oneself with reference to :
   (a) Developmental norms
   (b) Peers, both male and female
   (c) Health status
   (d) Garment sizing
3. (a) Record own diet for a day
   (b) Evaluate qualitatively for adequacy
4. (a) Record the fabrics and apparel used in a day
   (b) Categorise them according to functionality
5. (a) Record one day's activities relating to time use and work
   (b) Prepare a time plan for oneself.
6. (a) Record own emotions for a day in different contexts
   (b) Reflect on the "why" of these emotions and ways of handling them
7. List and discuss five messages from print and electronic media which have influenced own self.
8. Collection of information from different regions in India and critical discussion on:
   (a) Food practices including food taboos, fasting and festivity preparations
   (b) Clothing practices related to rites, rituals and occupation
   (c) Childcare practices in early years – gender similarities and differences
   (d) Traditional forms of communication including festive and special occasions
9. List and discuss 4-5 areas of agreement and disagreement with:
   (a) Mother (b) Father (c) Siblings
   (d) Friends (e) Teacher

   How would you resolve the disagreements to reach a state of harmony and mutual acceptance?
10. Documentation of a traditional textile art/craft of neighbouring area.
11. Visit to any one programme/institution (Govt./NGO) for children; observation of activities in the programme and report writing.

    Or

    Observation of any two children of different ages in the neighbourhood and reporting on their activities and behaviour.

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12. Construction of Quality of Life (QOL) and Human Development Index (HDI).
13. Relationship of fibre properties to their usage:
    (a) Thermal property and flammability
    (b) Moisture absorbency and comfort
14. Study one female adult and one male adult in the age range of 35 to 60 years with reference to:
    (a) Health and illness
    (b) Physical activity and time management
    (c) Diet behaviour
    (d) Coping with challenges
    (e) Media availability and preferences
15. Calculation of nutritive value of foods to identify rich sources of nutrients.
16. Preparation of different healthy snacks for an adolescent suitable in her/his context.
17. Study of labels on:
    (a) Food
    (b) Drugs and cosmetics
    (c) Fabrics and apparel
    (d) Consumer durables
18. Observation and recording of group dynamics in different locations/ situations such as:
    (a) Home
    (b) Eateries
    (c) Playfield
    (d) School
    (e) Recreation areas
19. Analysis of own communication styles and skills.
20. Plan a budget for self for a given situation/purpose.
21. List five problems faced by self or family as consumer. Suggest solutions to overcome the same.

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Class XII

Practicals

Specialisations in HEFS

Nutrition, Food Science and Technology

1. Qualitative tests on food adulteration
2. Development and preparation of supplementary foods for nutrition programmes.
3. Planning messages for nutrition, health and life skills using different modes of communication for different focal groups.
4. Preservation of foods using traditional and/or contemporary methods.
5. Packaging and study of shelf life of the prepared products.

Human Development and Family Studies

6. Preparation and use of teaching aids, using indigenous and locally available material to communicate socially relevant messages for children, adolescents and adults in the community.
7. Conducting mock sessions among peers in career guidance, nutrition counseling and personal counseling under supervision.

Fabric and Apparel

8. Preparation of articles using applied textile design techniques: tie and dye/batik/block printing.

10. Care and maintenance of fabric products:
    (a) Mending
    (b) Cleaning
    (c) Storage

Extension and Communication

13. Analysis and discussion of print, radio, and electronic media with reference to focus, presentation, technology and cost
14. Communicating with groups on any one of the following themes.
    (a) Social messages- gender equality, AIDs, female foeticide, child labour, rights abuse and other such themes)
    (b) Scientific fact/discovery
    (c) Any significant incident/event

Projects

1. Any one of the following may be undertaken and evaluated:
    (a) Analysis of traditional occupations prevalent in one's own local area, their beginnings, present status and challenges faced.
    (b) Analysis of gender roles, entrepreneurial opportunities, and future careers and family participation.

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2. Documentation of any public/mass campaign being implemented in own area, with reference to:
   (a) Purpose of campaign
   (b) Focal group
   (c) Modalities of implementation
   (d) Stakeholders involved
   (e) Media and methods used
   Comment on the relevance of the campaign.
3. Study of an integrated community- based programme being implemented in own area, with reference to:
   (a) Programme objectives
   (b) Focal group
   (c) Modalities of implementation
   (d) Stakeholders involved
4. Visit the neighbouring areas and interview two adolescents and two adults regarding their perception of persons with special needs.
5. Take a profile any one person with special needs, child or adult: to find out their diet, clothing, activities, physical and psychological needs.
6. Observe and document any event in your school/home or neighbourhood. Evaluate the same with respect to:
   (a) Its relevance
   (b) Resource availability and mobilisation
   (c) Planning and execution of the event
   (d) Financial Implications
   (e) Feedback from stakeholders

Suggest modifications for the future.

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